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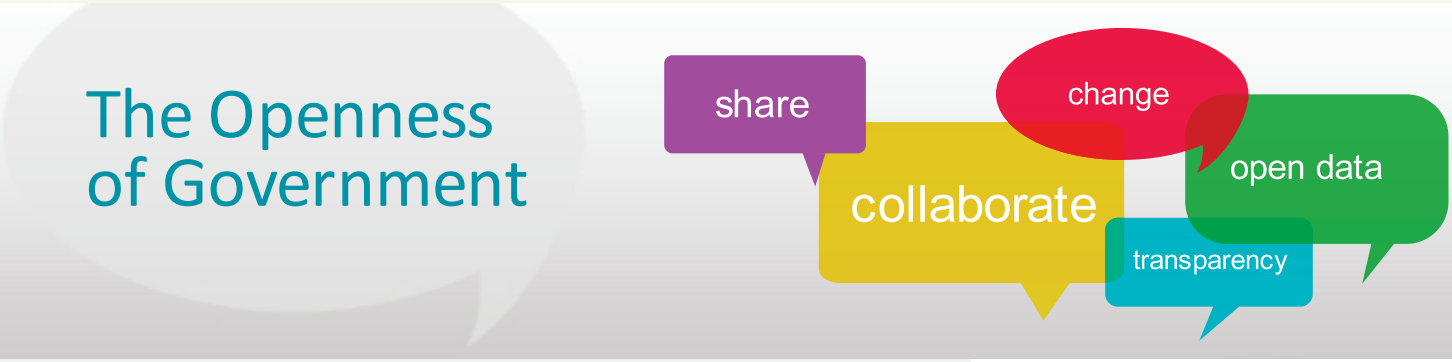
The Openness of Government



Editorial

Articles

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Editorial: The Openness of Government

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UK

In November 1959, for TV Guide Magazine, John F. Kennedy wrote about television as "a force that has changed the political scene". He had recently experienced the first televised Presidential debates, against Richard M. Nixon, and realised that things would never be the same again. But not even he foresaw that 50 years later, that same communication technology would still be rewriting the rules of politics and government, continuing to open up yet more aspects of political life — not least by bringing the workings of parliaments around the world into our homes.

But if you regard the phenomenon that is government, and the practice of politics within that, as social systems by which human groups (like nations, municipalities, companies, or even golf clubs) organise and regulate themselves, then it is clear that communication between people in the group is the crucial factor enabling them to work. So any technology that can change the nature and pattern of communication opens up new possibilities for the conduct of those activities.

Set in that context, the potential impact of the internet as a communication technology — open, two- and multi-way, accessible to many, cheap and easy, as compared to television — is immense. Many have ventured to make predictions. At one extreme are the "cyber-utopians", predicting mass engagement and democratic participation. At the other extreme are the "cyber-pessimists", who see only chaos and the breakdown of essential moderating processes.

But what we have seen in reality so far fits the pattern of adoption of almost any new technology: those with competitions to win (wars, elections, market share), or money to make (retailers, pornographers, fraudsters), are quickest to grasp its potential. So in politics and government, it has been parties and candidates fighting elections, and elected representatives and ministers defending their positions, who have led in the use of the internet.

The institutions of government however, and public bodies in general, do not typically have those motivators for early adoption. Their tasks demand equitable and repeatable processes, defined in law or regulation. Their scope and capacity for unilateral change is limited. The individuals within them are subsumed by their institutional roles. But progressively it becomes apparent to all how a technology might be brought in to support their core functions, and we get, for example, governments' administrative transactions carried out over the web.

Sometimes though we can get a step change. When a political will aligns in time and place with a technological capability, something transformative can happen. So it is with the Openness of Government. The ability of internet-based technologies suddenly to make available data and information previously held within the confines of government institutions and — much more importantly — make it usable, has in the recent past coincided with a political will to make government more transparent and accountable. Well, in a few countries around the world anyway.

This edition of the Journal of ePractice takes its — and Europe's — first considered look at this emerging phenomenon arising from the coincidence of politics, government and technology. We have

three themes. First, what is happening, and how do we make sense of it? Second, what are some of the technical things that need attention to really make this work? Third, what policy issues arise when we look at how citizens interact with it?

In our first article, **Noor Huijboom and Tijs van den Broek** offer you an overview of the (as yet short) history of open data policies and their implementation in a number of countries. Then **Luigi Reggi** reports on a pilot of a measurement framework for benchmarking governments' efforts to make data available. The results from that pilot show low scores all round for the use of linked data and open document formats, which leads us nicely to our next group of papers.

"Linked data" is the hot topic in this field, offering astounding potential, and **Mike Thacker** introduces us to what it is all about and why it is crucial to the openness of government, taking us to the leading edge of current practice. **Dimitra Anastasiou** then takes a detailed look at the role of open standards in a multi-lingual semantic web context.

Following this we have an overview of the policy issues in this area from **David Broster, Gianluca Misuraca and Margherita Bacigalupo**. Their review of the Lifting-Off Towards Open Government Conference organised by the Belgian presidency of the EU Council in December 2010 sets out the current policy framework for Open Government in Europe and provides an analysis of the key policy challenges and possible directions.

Surfacing an often-overlooked policy issue, **Bjorn Lundell's** article uses a survey of ICT procurement practice in Sweden to investigate how hidden burdens on citizens seeking to enjoy open government can be built in unwittingly at the tender specification stage of administrations' IT purchases. Then, taking the perspective of the citizen on ICT-enabled open government to the next level, **Paul Nash** presents a challenge to the prevailing policy approach to the still-large proportion of Europeans who do not use the internet, prompting us to look beyond IT skills as the solution for those for whom they are not an answer to the problems they have in life.

It is common to say that things move faster than they did in the 1950s and 1960s. But it is still a good bet that we have not packed the equivalent of 50 years of television's evolving impact into three or five years, or even the ten to 15 years we have been discussing e-Government and e-Democracy. We can be sure that the articles here in this Journal are at much the same point as JFK was: reflecting on the first experiences, but knowing that much more — unknowable — lies in wait.

Open data: an international comparison of strategies

Ever more governments around the world are defining and implementing "open data" strategies in order to increase transparency, participation and/or government efficiency. The commonly accepted premise underlying these strategies is that the publishing of government data in a reusable format can strengthen citizen engagement and yield new innovative businesses. However, as these open data strategies are relatively new, evidence of this expected impact is still limited. Important questions currently debated are: What is an appropriate open data strategy for governments? Why are some governments succeeding in opening up their databases and others struggling? How can open data policies contribute to increase citizens' trust and participation in government and provide an economic spur? In an inquiry for the Dutch Ministry of the Interior and Kingdom Relations, TNO (the Netherlands Organisation for Applied Scientific Research)[1] examined the open data strategies in five countries and gathered anecdotal evidence of its key features, barriers and drivers for progress and effects.[2] In this article we will give a brief overview of the research results and define key challenges for effective open data policy. Two of the main conclusions are that sound evidence of the precise effects is lacking (e.g. economic, social and democratic effects) and that the acquisition of more knowledge could strengthen a well-informed debate, remove governments' reluctance to invest in open data strategies and help them to develop an effective policy.

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Keywords

E-Government, open data, transparency of government

"This article examines the open data strategies in five countries and provides evidence of its key features, barriers and drivers for progress and effects. It defines key challenges for effective national and European open data policy."

1 www.tno.nl

2 Initially TNO studied six countries — also Estonia — but the open data strategy of the Estonian government was too limited to provide any sound research results.

1. Introduction

On his first full day in office as United States president in January 2009, Barack Obama announced that his administration would start a transparency strategy which would imply an unprecedented level of openness in government. In a memorandum for the Heads of Executive Departments and Agencies he stated that (The White House, 2009) *"[…] We will work together to ensure the public trust and establish a system of transparency, public participation, and collaboration. Openness will strengthen our democracy and promote efficiency and effectiveness in Government."*

The debate is resurging about the actual priority of the Open Government strategy of the United States, as the federal government spends about four times more on securing its data than opening it up[3]. In 2009, the journalist Maura Reynolds had already criticised Obama's openness strategy, stating that (Reynolds, 2009) *"[…] In practice, the new president's record on government secrecy and transparency has turned out to be decidedly mixed, with his administration seeming to take as many steps toward shielding government information as it has toward exposing it to the sunshine."* This ironic asymmetry, however, is likely to occur in most countries that have Open Government strategies.

Notwithstanding the criticism, various countries have been inspired by Obama's openness claims and have followed the United States in publishing similar openness memoranda or declarations. In December 2009, the United Kingdom government published the report "Putting the Frontline First: Smarter Government" in which it is argued that government has to radically open up and promote transparency (Chief Secretary to the Treasury, 2009). In May 2010, the Australian government published a Declaration of Open Government (AGIMO, 2010), in which it supported informing and engaging citizens through increased government transparency. In other Western countries "open data" has increasingly been placed on the agenda by politicians and policy makers. The Danish government launched an Open Data Innovation Strategy ('Offentlige Data I Spil') in July 2010 (Danish Ministry of Science, Technology and Innovation, 2010) and several regions in Spain have actively developed open data policies (e.g. the Basque Country, Catalonia and Aragon)[4]. Moreover, the European Council stated in the Visby Declaration (Presidency of the European Council, 2009) that European Union (EU) member states should seek to make data freely accessible in open machine-readable formats and stimulate the reuse of public sector information. Accordingly, the European Commission and the EU member states committed themselves in the European eGovernment Action Plan 2011-2015 to *"maximising the value of re-use of public sector information (PSI), e.g. by making raw data and documents available for re-use in a wide variety of formats (including machine-readable ones) and languages and by setting up PSI portals"* (European Commission, 2010).

The attention of governments to open data is not only stimulated by the strategies of the front runners, but also by the development of technologies which enable the creation of new services based on the open data. It may be clear that openness or transparency of government is a traditional 'good governance' principle and that the right to the freedom of information has been constitutionalised in many Western countries – in Sweden as early as 1766 (Staples, 2007). However, the rise of the social web and the explosive growth of mobile Internet enable and stimulate the creation of new services and social engagement based on the government data. Today, over 71 million Europeans surf the mobile internet for more than six hours each day, and the number of user-created online applications is increasing rapidly (EIAA, 2010). In other words, the fact that users can access the internet always and everywhere, and software increasingly supports user-created content and applications, provides

3 The federal budget for IT security was US$4.2 billion in 2011, while the budget for information sharing, which includes Open Data efforts, was US$0.9 billion. These data have been retrieved from the it.usaspending.gov on 21-2-2011.

4 See for instance http://opendata.euskadi.net/w79-home/es

new opportunities to increase government transparency.

2. Open data programmes

In our study for the Ministry of the Interior and Kingdom Relations, TNO examined five countries: Australia, Denmark, Spain, the United Kingdom and the United States. When comparing the strategies of these five countries, it appears that the focus of the strategic plans differs. For instance, whereas the emphasis of the United States government is on transparency to increase public engagement, Denmark underscores the opportunities that open data offers for the development of new products and services. The United Kingdom explicitly mentions the use of open data to strengthen law enforcement. In its report "Putting the Frontline First" the British Chief Secretary to the Treasury (2009) states that "The new online crime maps which went live in October 2009 mean that for the first time everyone in the country can search by postcode for facts about crime in their area and what is being done by the policy to deal with it."[5] Table 1 below gives an overview of key programmes, stakeholders involved and motivations for open data policy of the countries studied.

Table 1: Overview of programmes, objectives and focus open data strategies.

Country	Programme	Launch	Responsible authority	Key motivations
Australia	Government response to the Gov 2.0 report, Open Gov declaration	May 2010 and July 2010	AGIMO, 2010	*"Once public sector information is liberated as a key national asset, possibilities — foreseeable and otherwise — are unlocked through the invention, creativity and hard work of citizens, business and community organisations. Open PSI is thus an invitation to the public to engage, innovate and create new public value."*
Denmark	"Open data Innovation Strategy ('Offentlige Data I Spil')"	July 2010	Danish Ministry of Science, Technology and Innovation, 2010	*"Access to government data provides the basis for new services and different analyses, new information and better insights that are useful to citizens and businesses alike. ICT companies will be able to create new business in developing digital services and advanced content based on public data, and citizens can convert ideas and creativity into practical solutions to everyday problems."*
Spain	"Avanza2"	July 2010	Ministerio de Industria, Turismo y Comercio, 2010	*"Data are crucial for the knowledge economy. By publishing Public Sector Data, more (economic) value can be generated. The data are a source for the development of new products and services. In addition, data are important to exercise one's democratic rights. Citizens are better informed about and engaged in government."*

5 For example http://maps.met.police.uk

Country	Programme	Launch	Responsible authority	Key motivations
United Kingdom	"Putting the Frontline First: Smarter Government"	December 2009	Chief Secretary to the Treasury, 2009	*Action 1: strengthen the role of citizens and civic society, 1.3 Radically opening up data and promoting transparency: "Ultimately a more informed citizen is a more empowered citizen. In a modern democracy citizens rightly expect government to show where money has been spent and what results have been. […] Data can also be used in innovative ways that bring economic benefits to citizens and businesses by releasing untapped enterprise and entrepreneurship. "*
United States	Open Government Memorandum and Plan	January 2009 and April 2010	The White House, 2009) and US Department of State, 2010	*"My Administration is committed to creating an unprecedented level of openness in Government. […] Openness will strengthen our democracy and promote efficiency and effectiveness in Government. […] Transparency promotes accountability and provides information for citizens about what their Government is doing."*

Overall, this comparison of strategies demonstrates that a distinction can be made between three primary motivations to publish government data (see also Figure 1 below):

1. **Increase democratic control and political participation.** Most of the countries studied argue that the publishing of government data can empower citizens to exercise their democratic rights. The United Kingdom government for instance states that (Chief Secretary to the Treasury, 2009, p.25): *"Ultimately, a more informed citizen is a more empowered citizen. In a modern democracy citizens rightly expect government to show where the money has been spent and what the results have been"*[6]. The United States government published several datasets online in order to make politics and policy making more transparent and provide citizens with the tools to monitor government performance. For instance, it launched the website www.recovery.gov in 2009 on which state reports on expenditures are published.

2. **Foster service and product innovation.** Several governments emphasise the new opportunities for innovation generated by open government data. The Danish government for instance states in its strategy (Danish Ministry of Science, Technology and Innovation, 2010) states that "ICT companies will be able to create new business in developing digital services and advanced content based on public data, and citizens can convert ideas and creativity into practical solutions to everyday problems." Elaborating on the stimulation of user-driven innovation, the United Kingdom (Chief Secretary to the Treasury, 2009, p.26) argues that: "Data can also be used in innovative ways that bring economic benefits to citizens and businesses by releasing untapped enterprise and entrepreneurship. […] A study by the University of Cambridge found that the growth to the UK economy from freely releasing just a subset of the public sector data that are currently sold could be £160 million in the first year alone (Newbery et al, 2008)."

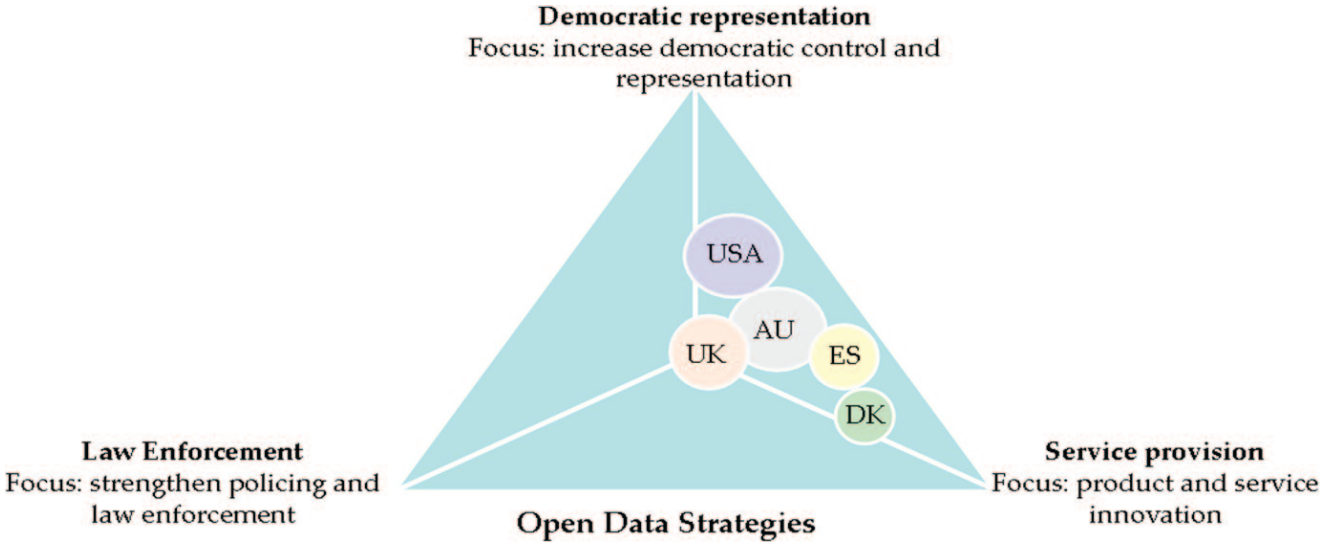
3. **Strengthen law enforcement.** The last motivation to open up government data is to involve citizens in and strengthen policing and law enforcement. In particular the United Kingdom and United States mention this motivation in their strategies. In these countries all kind of applications have been developed (by government and businesses) based on security data which aim to inform citizens and involve them in – for instance – criminal investigation tasks.[7]

6 The US Government is doing this via www.recovery.gov

7 Examples are the "FBI most wanted" iPhone application http://apps.usa.gov/fbis-most-wanted/ and the Metropolitan Police Crime Mapping http://maps.met.police.uk/

When mapping the motivations onto a triangle that illustrates the three basic tasks of government; representation, service provision and enforcement, the following picture emerges:

Figure 1: Overview of the focus of the open data strategies of the countries studied.



3. Open data instruments

The instruments applied by the five countries to implement open data policy can be roughly divided into four types: (a) education and training, (b) voluntary approaches, (c) economic instruments and (d) legislation and control.

Table 2: Overview of types of instruments applied by countries to implement their open data strategy.

Broad category	Instruments	Examples	Countries applying instrument
Education and training	Knowledge exchange platforms	The Danish government created a platform for government practitioners to exchange experiences/ideas on open data projects.[1]	AU, DK
	Guidelines	The Spanish government developed a guide for government practitioners to stimulate public sector information reuse.[2]	DK, ES
	Conferences, sessions, workshops	One aspect of the Aporta project in Spain is to inform and educate government practitioners during workshops on how to publish government data online.	AU, DK, ES, UK, US

(Footnotes)

1 http://digitaliser.dk/group/520340
2 http://www.aporta.es/web/guest/form_descarga_aporta

Broad category	Instruments	Examples	Countries applying instrument
Voluntary approaches	Overall strategies and programmes	Probably most well-known is the memorandum of President Obama (2009): *"My Administration is committed to creating an unprecedented level of openness in Government. We will work together to ensure the public trust and establish a system of transparency, public participation and collaboration. […]"*	AU, DK, ES, UK, US
	General recommendations	In its "Engage" report (Government 2.0 taskforce, 2009:xvii) the Australian government defines 13 recommendations, among which there is the recommendation that a lead agency should be established for advancing the Government 2.0 agenda (including open data).	AU, DK, ES, UK, US
	Public voluntary schemes	The UK describes in its report "Putting the Frontline First" (Chief Secretary to the Treasury, 2009:26): *"Our public data principles state that public data will be: (a) published in reusable, machine-readable form, (b) available and easy to find through a single easy to use online access point, (c) published using open standards and following the recommendations of the World Wide Web Consortium, (d), […]"*	AU, UK,US
Economic instruments	Competitions, app contests and camps	The government of the state of Victoria in Australia organised "App My State", a competition for citizens/businesses to develop apps while using public data[3]	AU, DK, ES, UK, US
	Financing of open data portals	Data.gov.uk, a website of the UK government, offers all kinds of national and local data for free to stimulate reuse[4].	AU, DK, ES, UK, US
Legislation and control	Public sector information law	In 2005 the Danish government enacted law no. 596 on the reuse of public sector data which involves an implementation of the EU PSI directive (European Commission, 2003).	ES, DK, UK
	Freedom of Information act	The Freedom of Information (FoI) Reform Act (2010) in Australia made the initial FoI act more pro-active in the disclosure of government information (Prime minister and cabinet, 2010).	AU, US
	Technical standards	One of the key pillars of the open data strategy of the Danish government is to create (open) technical standards which stimulate interoperability (Danish Ministry of Science, Technology and Innovation, 2010).	AU, DK, UK
	Monitoring	In Australia, the Information Commissioner has the task to monitor the progress being made with open data projects.	AU, UK, US

(Footnotes)

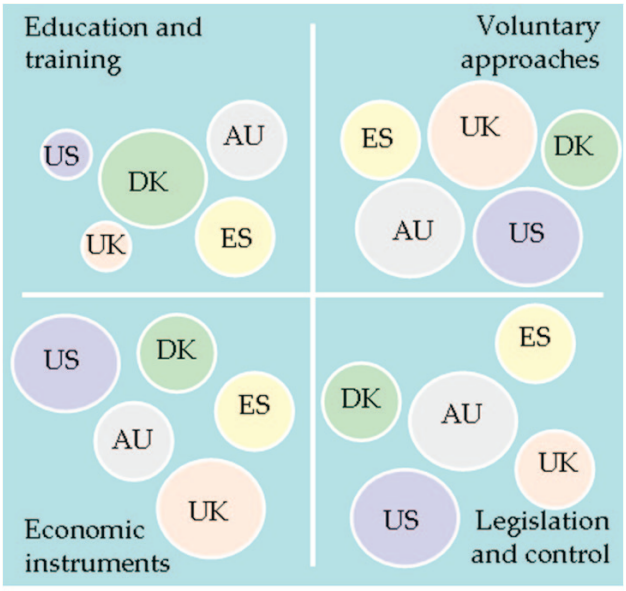
3 http://www.premier.vic.gov.au/app-my-state/about-app-my-state.html
4 http://data.gov.uk/

When comparing the five countries, it appears that they all applied various voluntary instruments to stimulate open data policy. However, the comparison also reveals important differences in the specific features of the instruments. Although all governments have open data strategies, the level of detail differs substantially. Whereas the Spanish Avanza2 programme only defines general starting points for open data policy, the Australian and United Kingdom governments describe concrete open data principles to be applied. As regards legislation and control, differences between countries can be found in the proactive approach with which government data have to be disclosed. In particular Australia and the United States have strong proactive legislation which requires free (or low cost) and easy (e.g. user friendly) access to government information.

The countries studied apply similar economic instruments. In all the five countries there are many initiatives where government bodies finance projects in which government data is published online. In addition, all governments have a central open data portal and organise events to award innovative service creation based on public data. However, the number of datasets online and the sophistication of the open data portals differ. In particular, the United States and United Kingdom have published many datasets (respectively 305 151 datasets in the US, of which 2001 are of high value, and

5 632 datasets in the UK)[8] and launched advanced websites. Education and training instruments are applied to a lesser extent. Of all the countries, Denmark is most active in the provision of education and training – this to stimulate coherence and standardisation of open data strategies of the separate government institutions. In Figure 2 below, the application of the four types of instruments by the five countries is depicted (the larger the circle the more instruments are applied):

Figure 2: Overview of the application of the four types of instruments by each country.



4. Barriers and drivers of open data policy implementation

To collect information about barriers and drivers for open data policy, TNO conducted a survey among policy-makers and experts in the five countries studied. The following table provides a "top 10 overview"[9] of the drivers and barriers mentioned by the stakeholders in each country:

Table 3: Overview of drivers and barriers of open data policy mentioned by stakeholders of each country.

#	Countries	Top 10 drivers	Countries	Top 10 barriers
1	AU, DK, ES, UK, US	**Strategies and experiences in front runner countries**. An important driver for open data policies are inspiring examples from other countries. The British "Show us a better way" (Arthur, 2008) was for instance one of the reasons for the Australian government to start "MashUp Australia"[1].	AU, DK, ES, UK, US	**Closed government culture.** Stakeholders of all the countries studied mentioned the closed government culture as an important barrier to open data policy. As one of the respondents stated: "government practitioners are rewarded for secrecy, not openness".
(Footnote) 1 http://mashupaustralia.org/				

8 Data.gov and Data.gov.uk were accessed on 28 December 2010

9 The more frequent drivers and barriers are mentioned among all countries, the higher they rank in the top 10 of table 3. When drivers and barriers are equally mentioned among all countries, the ranking is based on how extensive these topics were covered in interviews and documentation. However, more quantitative research is needed to substantiate the ranking.

#	Countries	Top 10 drivers	Countries	Top 10 barriers
2	ES, UK, US	**Political leadership**. President Obama may be the most well-known example of political leadership in the area of open data. Former UK Prime Minister Gordon Brown has been an important support of open data policy. In Spain, regional politicians championed open data policy.	AU, DK, ES, UK, US	**Privacy legislation**. The countries studied have strong privacy legislation and cannot publish information which leads to the identification of persons. All countries recognise the tension between open data policy and the privacy of their citizens.
3	AU, ES, US	**Regional initiatives**. In several countries, initiatives of regional and local government (e.g. apps4democracy of Washington D.C.[2]) provided an incentive for national open data policy.	AU, ES, UK, US	**Limited quality of data**. Several countries suggested that the quality of some government data is too limited to permit its publication.
4	DK, UK, US	**Citizen initiatives**. Best practices of user-driven innovations (e.g. app created to find public toilets in Denmark[3]) based on government data pushed several governments to (further) develop their open data policy.	AU, ES, UK, US	**Limited user-friendliness/info overload**. Technical experts of several countries stated that the existing databases should be converted into more user-friendly datasets to be of use for citizens and businesses.
5	AU, UK, US	**Market initiatives**. NGOs, entrepreneurs and journalists have put pressure on governments to open up. In the UK the newspaper, The Guardian, for instance launched the "Free our data" campaign in which citizens were asked to claim access to government data (Arthur & Cross, 2006).	AU, DK, ES, US	**Lack of standardisation of open data policy**. A lack of open data standards between (levels of) government organisations has been identified as a barrier to open data usage by citizens and businesses and subsequently new open data policy.
6	AU, UK, US	**Emerging technologies**. Respondents of several countries suggested that technological trends (e.g. mobile Internet and social software) enable engagement and innovation based on government data, which provides a window of opportunity for open data policy.	AU, UK, US	**Security threats**. In particular UK and US policy makers and experts stated that - because of security reasons - some government data cannot be published.
7	DK, ES, UK	**European legislation**. European countries mentioned the EU PSI Directive as an incentive for open data policy.	ES, DK, UK	**Existing charging models**. In particular the European countries identified existing charging models as a barrier. Currently, the income of several government organisations is based on the selling of data, which makes them reluctant to publish the data.
8	UK, US	**Thought leaders**. In some countries experts and communities played an important role in putting open data on the political agenda. Examples are Tim Berners-Lee and Tom Steinberg in the UK and Tim O'Reilly and Carl Malamud in the US.	ES, DK, UK	**Uncertain economic impact**. Uncertainty about the economic impact makes some countries reluctant to invest in open data policy.
9	UK, US	**Possibility of monitoring government**. In particular in the UK and US, the urge to keep a check on government provided a boost for open data policy (in particular political data).	ES, US	**Digital divide**. Respondents in Spain and the US have stated that their governments should solve the problem of the digital divide so as to ensure equal access to the open data.
10	UK	**Budgets cuts**. In the UK government savings were an incentive to publish data on public expenditures and involve citizens in choices to be made on where to make cuts.	US	**Network overload**. Experts in the US identified a limited capacity of existing networks as a barrier to open data policy.

(Footnotes)

2 http://www.appsfordemocracy.org/
3 http://www.findtoilet.dk/

Interestingly, policy makers and experts in all the countries studied, mentioned inspiring strategies and experiences in other countries as an important driver for open data policy. Some policy makers even stated that the fact that their country has a track record of being an advanced information society, and that they wanted to maintain that image, was an important incentive for their policy on public sector information reuse. Notable is also the "political leadership" factor which was identified as a driver for open data policy by Spain, the United Kingdom and the United States. Policy makers in Australia and Denmark stated that the lack of political leadership formed a barrier to further progress on open data policy. As regards the barriers, closed government culture and privacy legislation

have been mentioned by policy makers and experts in all countries. Many respondents stated that norms such as confidentiality, risk avoidance and fear of political escalation prevent government practitioners from publishing datasets. This barrier may be related to the "political leadership" driver in the sense that a high-level role model may help to break through any existing and ingrained routines. Privacy concerns have also been identified as an important barrier for open data policy. On the one hand, governments perceive opportunities emerging from open data (e.g. increased social engagement and innovation) and, on the other hand, they discern an increased threat to peoples' privacy.

A comparison between the drivers and barriers leads to another interesting observation: whereas the drivers lie predominantly outside government, the barriers are within government organisations. Important drivers for open data policy are for instance citizen pressure, market initiatives, emerging technologies and the ideas of thought leaders. There are several examples in which groups of citizens or businesses successfully put pressure on the government to open up. One example is the "Free our data" campaign of the Guardian newspaper in the UK (Arthur & Cross, 2006). The newspaper called on readers to claim access to government data, which then gave a boost to the UK open data policy (Arthur & Cross, 2006). The table shows that the barriers predominantly lie within government, such as the closed culture, limited quality of data, lack of standardisation and existing charging models. This difference between external and internal factors which drive or hamper open data policy may provide clues about the choice of an optimal policy mix for open data. External pressure may for instance be used to solve certain internal impediments such as the unwillingness of organisations to change their financing model.

Another difference which is demonstrated by Table 3 is between drivers and barriers for open data in Anglo-American countries and other countries. In particular, in the UK and the US, there is pressure from citizens, NGOs and businesses on governments to open up data. This may be caused by the fact that these countries generally have a longer and more extensive tradition of watching and monitoring the performance of government. In addition, it seems that in particular in the European countries the charging models of government data are seen as an important barrier to open data policies. These countries also pose questions about the economic value of open data and are reluctant to define policy when evidence of economic impact is lacking. Yet, in these countries the European Public Sector Information directive on the reuse of government data (European Commission, 2003) has been identified as an important driver for open data policy.

5. Effects of open data policy

In none of the countries studied did the research team find sound evidence of the impact of the open data policy. The UK and the US are the only countries which have evaluated their open data policies. In the publication "Open Government – some next steps for the UK" the Centre for Technology Policy Research (2010) describes the open data policy of the UK government and defines recommendations for future policy. Although the study provides insight into the instruments applied by the UK government to implement its Open Government strategy (which includes an open data strategy), it does not assess the precise economic and social impacts of these instruments. In the US, the Office for Budget and Management called on all federal governments to evaluate their Open Government plans before 27 April 2010.[10] This self-evaluation contained 30 criteria: their formulation was based on President Obama's declaration.[11] Although this self-evaluation assesses the process of the development, the completeness and the concreteness of the Open Government plan, it does not address its impact.

10 http://www.whitehouse.gov/open/around/eop/omb/self-evaluation
11 http://www.whitehouse.gov/open/documents/evaluation

In order to justify their open data strategy, the countries examined often refer to more general and macro-economic studies on open data. The Australian government for instance quoted a study on spatial data, "The Value of Spatial Information: The impact of modern spatial information technologies on the Australian economy" (Acil Tasman, 2008), which calculated that the industry for spatial data in 2006/2007 represented a turnover of 1.37 billion Australian dollars. In Denmark, authorities referred to a study by Gartner (2010), which estimated that – by publishing government data – the Danish government could stimulate the creation of new services to the value of 600 million Danish krone (Gartner, 2010). Governments of several countries (e.g. Spain and United States) quote the PIRA (2000) and MEPSIR (2006) studies of the European Commission, which calculated respectively that (a) the economic value of public sector information is 750 billion Euros in the US and 68 billion Euros in Europe and (b) the market for government information in the EU is estimated at around 27 billion Euros. Another influential study which is often referred to is "Models of Public Sector Information Provision via Trading Funds" of Cambridge University (Newbery et al, 2008) which estimated the economic value of government data in the UK at £6 billion.

Although most countries legitimise their open data study based on these studies, many policy makers also recognise that the precise economic impact of open data for their country, and specific sectors or organisations, remains largely unclear. Impact studies at both the meso and micro levels are lacking and, since the macro studies use different indicators to estimate the economic impact, the calculations differ substantially (Uhlir, 2009). Desk research by the research team revealed that even less evidence is available on the social and democratic effects of open data policy. In the literature on government transparency and trust research, results are contradictory (e.g. Rothstein, 2001, Bovens, 2003 and Curtin & Meyer, 2006). Some studies for instance found that government transparency increases trust in government (as people perceive that they have a stronger control over government) and other studies found that it decreases trust in government (as more government failures are identified). The causal relation between open data and democratic participation is far from clear. In a study on "Open data, democracy and public sector reform" by Davies (2010), a mere 36% of the respondents stated that open data improves the local or national democracy. However, the survey was not representative and it is not clear from the study why respondents find that open data does not contribute to a stronger democracy. The cause may for instance lie in information overload or the type of data published, two factors which could be easily overcome by taking appropriate measures. In addition, there seems to be a slight "pro open data" bias in publications on the subject. Bovens (2003) is one of the few scientists who identified the dark side of open data as he contends that radical openness may result in a culture of political scandals and obstruct government processes due to political cynicism and a lack of trust in government.

All in all, one has to conclude that evidence of economic, social and democratic impacts of open data policy is still immature or lacking. More research is needed in order to place a focus on open data policy, decide on the use of certain instruments and reach the desired impact.

6. Conclusions

This TNO study shows that, in an increasing number of Western countries, "open data" is being placed on the political and administrative agenda. The study also demonstrates that – although federal and regional governments have defined open data strategies – individual government agencies are often reluctant to implement these strategies. A crucial barrier for their implementation is the closed culture within government, which is caused by a general fear of the disclosure of government failures and any ensuing political escalation. Another important research result yielded by the study is the lack of understanding of the precise effects of open data strategies, which make government

agencies hesitant to open up data actively. More insight into the multiple impacts of open data (e.g. economic, social and democratic impacts) could be one of the keys to establish successful and effective open data policies. By assessing and addressing both positive and negative impacts, government agencies will be enabled to choose deliberately a certain strategy, focus and instruments. The research shows that the focus of strategies is currently on fostering innovation and strengthening democratic participation, whereas some evidence indicates that open data could also contribute to enhancing law enforcement. In addition, the character of the instruments is predominantly voluntary and legal, whereas education and training could also be effective – in particular in the case of a closed governmental culture. In conclusion, the acquisition of more knowledge on the positive and negative effects (e.g. economic, social and democratic effects) of the "open data" phenomenon could strengthen a well-informed debate, remove governments' reluctance and help them to develop an effective policy.

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Benchmarking Open Data Availability across Europe: The Case of EU Structural Funds

Although Open Government, Government 2.0 and Open Government Data have been at the centre of the debate on e-Government policy over the last two years, the European Union still lacks comparable data on transparency. European Regional Policy is the ideal context to test a *Benchmarking 2.0*: it involves all Member States and EU regions, influences national and regional policies and can push the transparency agenda in those areas of Europe where administrative culture and capacity is traditionally low. In this paper the datasets on beneficiaries of European Structural Funds provided by the Managing Authorities of the Operational Programmes of EU27 are evaluated through a scheme based on the 8 principles of Open Government Data. The paper compares the performance of the European Countries for the first time and sets new targets that could be considered as possible requirements for the next programming period.

Disclaimer:

The views expressed in this article are those of the author and, in particular, do not necessarily reflect those of the Ministry of Economic Development.

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Keywords

European Structural Funds, regional policy, benchmarking, government transparency, open government data, methodology, method, evaluation

> The results of this web-based survey show that the European Cohesion Policy is only halfway to accomplishing a paradigm shift to open data, with differences in performance both between and - in some cases - within European Countries.

1. Introduction

1.1 Benchmarking Government 2.0: from e-Government interactivity to open data availability

More than two years ago, in this journal, David Osimo raised the question of how to benchmark e-Government in the web 2.0 era. After having analysed the traditional e-Government benchmarking method adopted at European level, he identified transparency as a flagship initiative for e-Government policy and Open Government Data (OGD) availability as the way to measure it (Osimo, 2008). Since then, the debate on the so-called 'Government 2.0' has rapidly evolved and the "2.0" meme has risen from obscurity to mainstream in e-Government policy (Osimo, 2010b).

The new European e-Government Action Plan 2011-2015 (European Commission, 2010c) highlights the two main sources of potential benefits of Government 2.0: transparency and data re-use. The former is a direct effect of opening up data and information on government decision making, such as laws and regulations, policies and finance. The latter, which implies a call for "raw data" (Robinson et al., 2010; Berners-Lee, 2006), focuses on the creation of value by combining data from different sources and making "mash-ups" and new applications, both for commercial and non-commercial purposes. The economic value generated by the exploitation of Public Sector Information (PSI) by the public and private sector is estimated as being significant by several studies (see among others Pollock, 2009; Dekkers et al., 2006).

Although these topics are at the centre of the current debate on e-Government policy, the need to develop and test new methodologies to benchmark open data availability among the Member States of the European Union remains largely unsatisfied. The new edition of the well-established supply side benchmarking exercise confirms the importance of updating and expanding the scope of the analysis by including new metrics on *"Transparent and Open Government"* (Capgemini, 2010, 134). Since traditional rankings on online services availability and sophistication can play a role in giving an impulse to countries still engaged in developing digital infrastructures and delivering their basic public services online (Reggi, 2009), new indicators on transparency should be introduced in a seamless way, while maintaining core indicators and comparability of datasets over time.

Osimo (2008) proposes a list of "basic public data" to be measured at EU level. The first in the list is "beneficiaries of public funding", which includes the beneficiaries of European Structural Funds. Regional policy is in fact the second biggest item in the EU budget after agriculture - it absorbs approximately one third of the total budget - and, moreover, it forces each Member State to share the same rules and regulations, which can improve the comparability of data. Beneficiaries of Regional Policy could indeed represent an interesting testing domain for a new open data benchmarking.

As shown in more detail in Section 3, though, the surveys commissioned in the last two years by the European Parliament and the European Commission were either too early (carried out when the 2007-13 period implementation was in its early phase) or focused mainly on qualitative information rather than on quantitative and comparable data.

The aim of this paper is therefore to provide an objective, web-based benchmarking of the publicly available data on projects and beneficiaries of the 2007-13 Structural Funds across Europe. The methodology and the results of this test (see Sections 4 and 5 respectively) could represent a methodological basis for an extended benchmarking exercise that should include other kinds of data from European Policies such as the beneficiaries of the Common Agricultural Policy.

2. The Regional Policy and the European Transparency Initiative

European Regional Policy (otherwise named European Cohesion Policy) *"aims to promote harmonious development of the Union and its regions by reducing regional disparities"* (Article 174 of the Treaty).

The policy *"underpins the growth model of the Europe 2020 strategy including the need to respond to societal and employment challenges all Member States and regions face. [...] The multilevel governance system for the policy helps to make the EU more visible to its citizens"* (European Commission, 2010a). The role of Structural Funds in financing the Europe 2020 strategy is in fact more and more significant (European Commission, 2010b).

Regional policy is implemented mostly thanks to two Structural funds, namely the European Regional Development Fund (ERDF) and the European Social Fund (ESF). ERDF is aimed at levelling economic differences among regions and it finances, for example, initiatives for research and innovation, local development and employment, infrastructure, and protection and improvement of the environment. ESF was established to improve the quality and accessibility of jobs and employment opportunities within the European Union.

The amount of Community resources dedicated to Regional Policy in 2007-13 is EUR 347 billion (European Commission, 2008), 3.75% of which is dedicated to ICT and Information Society (European Commission, 2007). It constitutes the second largest item in the Community budget after agriculture.

Financial resources are concentrated on the lagging regions that fall under the Convergence objective, with 81.5% of the investment available. The declared rationale of the Convergence objective is to promote growth-enhancing conditions and factors. Outside the Convergence regions, the Regional Competitiveness and Employment objective (Competitiveness) aims at strengthening competitiveness and attractiveness, as well as employment, especially through innovation and the promotion of the knowledge society. The European Regional Cooperation objective (Cooperation) strengthens cross-border co-operation through joint local and regional initiatives, trans-national co-operation and interregional co-operation and exchange of experience.

In addition to the Community financing, substantial national and regional budgets are mobilised, which must conform to EU rules and regulations. One of the goals of the Regional Policy is in fact to improve the quality of national and regional policies and to strengthen administrative capacity in the disadvantaged regions (see for example Bache, 2008; Baum & Marek, 2008; Barca, 2009).

Such a positive influence on national and regional policies could be leveraged also to foster transparency across Europe.

Structural Funds regulations for the 2007-13 programming period require the Managing Authorities (Member States and Regions managing an Operational Programme financed by Structural Funds) to publish the names of the beneficiaries, the name of the project co-financed with Structural Funds and the corresponding amount of public funding received. In fact, according to Article 69 of the Council Regulation No 1083/2006 of 11 July 2006 and repealing Regulation (No 1260/1999), *"the Member States and the Managing Authority for the operational programme shall provide information on and publicise operations and co-financed programmes. The information shall be addressed to European Union citizens and beneficiaries with the aim of highlighting the role of the Community and ensuring that assistance from the Funds is transparent"*. In particular, Commission Regulation No 1828/2006 of 8 December 2006 (art. 7) states that *"the managing authority shall be responsible for organising the publication, electronically or otherwise, of the list of beneficiaries, the names of the operations and the amount of public funding allocated to the operations"*.

Moreover, in November 2005 the European Commission launched a 'European Transparency Initiative', which is promoted and implemented through different regulatory texts and documents aiming at increasing financial accountability and strengthening personal integrity and institutional independence.

A Green Paper presented by the Commission on 3 May 2006 identifies the four main components of the ETI in (1) the public access to documents, (2) the rules and standards on professional ethics of public office holders in the European institutions, (3) the lobbying transparency and (4) the information on beneficiaries of EU funds.

In 2008 the Commission provided guidance to Member States on the practical implications of implementing the Transparency Initiative with a detailed *Guidance Note* that the European Commission and Member States agreed on in the COCOF of 23 April 2008 (European Commission, 2008b). The note commits to the Commission the coordinating role of facilitating access to the data available on the websites of the managing authorities and proposes a common standard for the publication of data, so as to enable interested parties to carry out consistent analyses across the EU. Although the set of minimum information is still relatively small and should be extended, the European Transparency Initiative certainly represents a breakthrough innovation in the way most European Countries implement public policy.

An *"indicative table for setting the list of beneficiaries of EU funding"* is annexed, focusing on 6 main standard designators of the database fields that should be included:

1. The name of beneficiaries (defined by Article 2 of the Council Regulation No 1083/06 as *"operator, body or firm, whether public or private, responsible for initiating and implementing operations. In the context of aid schemes under Article 87 of the Treaty, beneficiaries are public or private firms carrying out an individual project and receiving public aid"*).
2. The name of the operation (defined as *"a project or group of projects selected by the managing authority of the operational programme concerned or under its responsibility according to criteria laid down by the monitoring committee and implemented by one or more beneficiaries allowing achievement of the goals of the priority axis to which it relates"*).
3. The amount of public funding committed to the operation.
4. The amount of public funding paid to the beneficiary at the end of the operation.
5. The year of final payment.
6. The date of the last update.

3. Previous studies evaluating the lists of beneficiaries of Structural Funds

Two reports recently commissioned by European Institutions have dealt with the evaluation of existing data on projects and beneficiaries of European Structural Funds in the 2007-13 programming period.

The first study was funded by the European Parliament's Committee on Regional Development and presented in July 2010, though it was completed in June 2008, only one year after the beginning of the 2007-13 period (CSIL, 2008). The report, entitled "The Data Transparency Initiative and its Impact on Cohesion Policy", evaluates the implementation of the European Transparency Initiative

by providing some quantitative data and four case studies about Finland, Italy, the Netherlands and Poland.

The situation reported, mainly due to the very early phase of policy implementation, *"results in incomparable, often not machine readable and in some countries almost unusable data in different EU languages and different currencies"*. Only 78% of the European regions managing an ERDF operational programme provide the minimum information required. 19% provide a description of the operations, 41% a location of the projects, 27% the amount of national co-funding. Moreover, while 44% of EU regions publish data on the total amount of funding, only 32% of available datasets specify the amount of public money actually paid out. PDF is the prevailing format in which data are released (52%), followed by XLS (27%) and HTML (21%); a situation that had not changed almost two years later (Reggi, 2010).

The report draws some final recommendations:

- to provide additional essential information, such as contact details, localisation, project summaries, description of project partners, etc.
- to make databases fully searchable and compatible, so as to make possible an EU-wide outlook of the data.
- to describe the data in English and not only in the local language.

The second report - "Study on the quality of websites containing lists of beneficiaries of EU Structural Funds" by Technopolis Group - was funded by the DG Regional Policy of the European Commission (Technopolis Group, 2010). The study adopted mainly qualitative methods in answering its evaluation questions, and data are collected through a series of interviews and an online questionnaire.

The interviews addressed the questions of comparability and compatibility of data across the Member States and regions and concludes with a review of the technical approaches to the presentation of information.

Table 1 - Member state approaches in publishing data on beneficiaries of Structural Funds

Centralised / national approach	Regional / decentralised approach
Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Latvia, Lithuania, Luxembourg, Malta, Romania, Slovakia, Slovenia, Spain, Sweden	Australia, Belgium, Bulgaria, Germany, Ireland, Italy, Netherlands, Poland, Portugal, United Kingdom

Source: Technopolis Group, 2010.

The study also classifies the Member States in two groups: countries following a centralised approach, which have developed centralised information systems resulting in one shared publicly available dataset, and countries following a regional approach, which implies decentralised and fragmented databases.

4. Methodology and data collection

A web-based survey was conducted in October 2010 in order to explore the availability and quality of the lists of projects and beneficiaries of the European Regional Development Fund (ERDF) and the European Social Fund (ESF) published by the managing authorities.

Table 2: Operational programmes analysed by objective, fund, regional scope, type of information system used and Member State

	Regional objective*			Fund		Nat / reg		Info system		All Operational Programmes
	Convergence	Comp.	Cooperation	ERDF	ESF	National or multireg.	Regional	Centralized	Not centralized	
BG	7	-	-	5	2	7	-	-	7	**7**
BE	2	8	-	4	6	1	9	-	10	**10**
CZ	15	2	-	14	3	8	9	17	-	**17**
DK	-	2	-	1	1	2	-	2	-	**2**
DE	14	22	-	18	18	1	35	-	36	**36**
EE	3	-	-	2	1	3	-	3	-	**3**
GR	14	-	-	10	4	5	9	14	-	**14**
ES	23	22	-	23	22	7	38	45	-	**45**
FR	9	27	-	31	5	5	30	36	-	**36**
IE	-	3	-	2	1	1	2	-	3	**3**
IT	19	33	-	28	24	9	43	-	52	**52**
CY	1	1	-	1	1	2	-	2	-	**2**
LV	3	-	-	2	1	3	-	-	3	**3**
LT	4	-	-	2	2	4	-	4	-	**4**
LU	-	2	-	1	1	2	-	2	-	**2**
HU	14	1	-	13	2	8	7	15	-	**15**
MT	2	-	-	1	1	2	-	2	-	**2**
NL	-	5	-	4	1	5	-	-	5	**5**
AT	2	9	-	9	2	1	10	-	11	**11**
PL	21	-	-	20	1	5	16	21	-	**21**
PT	11	3	-	10	4	7	7	-	14	**14**
RO	7	-	-	5	2	7	-	7	-	**7**
SI	3	-	-	2	1	3	-	3	-	**3**
SK	10	1	-	9	2	9	2	11	-	**11**
FI	-	7	-	5	2	-	7	7	-	**7**
SE	-	9	-	8	1	1	8	9	-	**9**
UK	6	16	-	16	6	-	22	-	22	**22**
Cross-border cooperation	-	-	54	54	-	-	-	-	54	**54**
Interreg cooperation	-	-	3	3	-	-	-	-	3	**3**
Trans-national cooperation	-	-	14	14	-	-	-	-	14	**14**
Total	**190**	**173**	**71**	**317**	**117**	**108**	**254**	**200**	**234**	**434**

* Programmes belonging to both Convergence and Competitiveness objectives are classified into Convergence objective

Source: Author's elaboration based on European Commission - DG Regional Policy data (June 2009)

The survey is based on the official database on the approved Operational Programmes provided by the DG Regional Policy in June 2009. All the 434 Programmes approved at that time were taken into

account[1]. As showed in Table 2, the programmes are classified into various categories depending on the objective (Convergence, Regional Competitiveness and Employment, European Regional Cooperation), the fund (European Regional Development Fund, European Social Fund) and the regional scale (National or Multi-regional, Regional). The studies on the lists of beneficiaries of structural funds mentioned before helped classify the programmes also by type of information system used (centralised, decentralised). Programmes with regional cooperation objectives, by definition, involve more than one Member State, and therefore could not be connected to any particular country.

Datasets published on the web were identified through a visit to the URIs indicated by the managing authorities and reported in the *Inforegio*[2] web site (managed by the DG Regional Policy of the European Commission) or in the web site of the European Social Fund[3] (managed by the DG Employment). When the link was broken or unavailable, a search in the websites of regional operational programmes and of regional managing authorities was performed.

Transparency of every single operational programme is assessed against a 4-stage model reflecting the quality of data provided. Stage models have been widely used in the literature to define a sort of evolutionary path toward excellence in service delivery, within both an "e-Government" (Capgemini, 2009; United Nations, 2010, Baum & Di Maio, 2000; Layne & Lee, 2001; Andersen & Henriksen, 2006) and "Goverment 2.0" (Osimo, 2008; Johnson, 2010) paradigm.

In order to analyse the datasets from an *open data* perspective, the eight principles of Open Government Data are considered as evaluation variables (Open Government Working Group, 2007). These principles were developed by 30 Open Government advocates[4] during a meeting in Sebastopol, California on 7-8 December, 2007, coordinated by Tim O'Reilly of O'Reilly Media and Carl Malamud of Public.Resource.Org. The group suggested eight desirable properties for government data that, if implemented, *"would empower the public's use of government-held data"*. These eight principles are now considered as a worldwide *de facto* standard for open data evaluation and are cited as a key reference by practitioners and academics in policy discussions as well as in the top academic journals in the field (Davies, 2010; Osimo, 2010a; Bertot et al, 2009; Johnson, 2010). They are identified as follows[5]:

1. *Complete* - All public data are made available. Public data are data that are not subject to valid privacy, security or privilege limitations
2. *Primary* - Data are as collected at the source, with the highest possible level of granularity, not in aggregate or modified forms
3. *Timely* - Data are made available as quickly as necessary to preserve the value of the data
4. *Accessible* - Data are available to the widest range of users for the widest range of purposes
5. *Machine processable* - Data are reasonably structured to allow automated processing.
6. *Non-discriminatory* - Data are available to anyone, with no requirement of registration.
7. *Non-proprietary* - Data are available in a format over which no entity has exclusive control
8. *License-free* - Data are not subject to any copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed.

1 A list of operational programmes can be found at http://ec.europa.eu/regional_policy/country/prordn/index_en.cfm
2 http://ec.europa.eu/regional_policy/country/commu/beneficiaries/index_en.htm
3 http://ec.europa.eu/employment_social/esf/discover/article_7093_en.htm
4 A list of the 30 OGD advocates can be found at http://public.resource.org/open_government_meeting.html
5 See also the additional notes: http://www.opengovdata.org/home/8principles/annotations

The definition of the 4 stages for each principle (see Table 3) is mainly based on the W3C and UK Central Office of Information guidelines. For each principle a score is attributed as follows:

Stage 0 = 0%

Stage 1 = 33%

Stage 2 = 66%

Stage 3 = 100%

A composite indicator measuring the overall quality of each Operational Programme is obtained as a simple mean of the scores attributed to the 8 principles.

Table 3: Evaluation scheme and description of the stages

	Principle	Description	Stage 0 (0%)	Stage 1 (33%)	Stage 2 (66%)	Stage 3 (100%)
1	Complete	All public data are made available. Public data are data that are not subject to valid privacy, security or privilege limitations.	Data not available	Low completeness: presence of project, beneficiary and total cost of the project	Good completeness: all European Transparency Initiative (ETI) recommendations are met	High completeness: ETI recommendations met + detail for EU or other kind of co-financing funds and status of the project provided.
2	Primary	Data are as collected at the source, with the highest possible level of granularity, not in aggregate or modified forms.	Data not available	Low granularity: aggregated data	-	High granularity: information available for each beneficiary (raw data)
3	Timely	Data are made available as quickly as necessary to preserve the value of the data.	No info on update	-	Day or month of the last update is provided	Information on the frequency of update is provided
4	Accessible	Data are available to the widest range of users for the widest range of purposes.	No accessibility: broken link to the DB from Inforegio or ESF websites, no description provided	Low accessibility: the link from Inforegio or ESF websites is correct	Good accessibility: DB available by 3 clicks from the HP.	High accessibility: good description of the data or metadata is provided. The DB is located by 3 clicks from the HP. Columns are translated into English.
5	Machine processable	Data are reasonably structured to allow automated processing.	Not machine-processabile format: PDF, DOC, results displayed in “HTML reports”	Machine-processable format: CSV, HTML, XLS, ODT	Data interchange format: XML, JSON	Linked data: RDF
6	Non-discriminatory	Data are available to anyone, with no requirement of registration.	Requirement of registration and approval	Requirement of registration and download for everyone	-	Non-discriminatory: no requirement of registration

	Principle	Description	Stage 0 (0%)	Stage 1 (33%)	Stage 2 (66%)	Stage 3 (100%)
7	Non-proprietary	Data are available in a format over which no entity has exclusive control.	Proprietary formats: XLS, DOC	-	-	Open formats and standard formats: CSV, RDF, XML
8	License-free	Data are not subject to any copyright, patent, trademark or trade secret regulation. Reasonable privacy, security and privilege restrictions may be allowed.	Not license-free: data are subject to copyright, patent, trademark or trade secret regulation	No license specified. Terms of use as given in law	-	Licence is compatible with Creative commons (by and reuse for commercial) or Open data commons

5. Results

Table 4: Average scores of the Operational Programmes of EU27, by objective, fund, regional scope and type of information system used

	Overall performance	Complete	Primary	Timely	Accessible	Machine processable	Non-discriminatory	Non-proprietary	License-free
Regional objective									
I - Convergence (n=190)	**49.6%**	48.7%	92.1%	54.3%	53.2%	15.1%	100.0%	0.5%	33.0%
II - Competitiveness (n=173)	**48.6%**	40.5%	91.3%	54.1%	54.3%	11.4%	100.0%	4.0%	33.0%
III - Cooperation (n=71)	**46.3%**	28.8%	76.5%	62.3%	65.5%	4.2%	100.0%	0.0%	33.0%
One way ANOVA test (F value)	2.34*	18.86***	9.04***	2.08	4.37**	13.07***	-	3.94**	-
Bonferroni test (F value)	*I > II: 0.01* *I > III: 0.03** *II > III: 0.42*	*I > II: 0.08**** *I > III: 0.19**** *II > III: 0.11****	*I > II: 0.007* *I > III: 0.15**** *II > III: 0.14****	*I > II: 0.002* *I > III: -0.07* *II > III: -0.08*	*I > II: -0.011* *I > III: -0.12*** *II > III: -0.11***	*I > II: 0.03** *I > III: 0.1**** *II > III: 0.07****		I > II: -0.03** I > III: 0.005 II > III: 0.04**	
Fund									
ERDF (n=317)	49.3%	42.5%	88.0%	59.8%	56.6%	13.0%	100.0%	1.9%	33.0%
ESF (n=117)	46.8%	41.2%	92.6%	44.0%	53.1%	8.7%	100.0%	1.7%	33.0%
t-test (t value)	-2.130***	-0.473	1.511*	-4.881***	-1.018	-2.504***	-	-0.125	-
Regional scope									
National or multireg. (n=108)	48.3%	47.3%	87.6%	53.3%	50.3%	14.7%	100.0%	0.0%	33.0%

	Overall performance	Complete	Primary	Timely	Accessible	Machine processable	Non-discriminatory	Non-proprietary	License-free
Regional (n=254)	49.5%	43.9%	93.8%	54.6%	55.1%	12.9%	100.0%	3.1%	33.0%
t-test (t value)	1.046	-1.193	2.294***	0.336	1.456*	-0.967	-	1.868**	-
Information system									
Centralised (n=200)	52.1%	47.6%	98.8%	52.3%	61.4%	19.8%	100.0%	3.5%	33.0%
Not centralised (n=234)	45.8%	37.5%	81.0%	58.3%	50.7%	5.1%	100.0%	0.4%	33.0%
t-test (t value)	*-6.160****	*-4.311****	*-6.931****	*2.011***	*-3.589****	*-10.873****	-	*-2.382****	-
All Operational Programmes	**48.7%**	42.2%	89.2%	55.5%	55.6%	11.9%	100.0%	1.8%	33.0%

* Significant at 10% level. ** Significant at 5% level. *** Significant at 1% level

Bonferroni, Scheffe and Sidak tests provided the same results in terms of significance

First of all, findings suggest that European Cohesion Policy is only halfway to accomplishing a paradigm shift to open data, which is ideally correspondent to the 100% score. The overall performance of all Operational Programmes (48.7%) is mainly driven by *Non-discriminatory* (100%) and *Primary* (89.2%) principles, which make a major contribution to the average score. This could be considered a direct effect of the current regulations of Structural Funds. In fact, the provision of the highest possible level of granularity (project and beneficiary) is one of the requirements of regulations, while the publication without restrictions could also be interpreted as mandatory. On the contrary, the aspects not covered either by regulations or the European Transparency Initiative show very low results; this is the case of the format in which data are published (*Machine-processable* and *Non-proprietary* are the principles with the lowest values, 11.9% and 1.8% respectively). These findings seem to imply that managing authorities of the programmes are more interested in formally meeting the requirements of the regulation than pursuing real transparency.

Considering the variation among the different categories, we first notice that, on average, programmes belonging to the *Convergence* and *Competitiveness* objectives show higher scores on overall quality (49.2% and 48.6% respectively) than those belonging to the *Cooperation* objective (46.3%)[6]. A statistically significant difference emerges between the programmes funded by European Regional Development Fund (49.3%) and by European Social Fund (46.8%), while no significant variation is found between Regional and National or Multiregional Programmes.

A considerable difference (*t value* is significant at 1% level) in performance is shown when comparing datasets that are shared and centralised at national level (52.1%) with those which are managed by a single regional authority (45.8%). This variation is also statistically significant with regard to all the indicators examined, and is probably due to the fact that a centrally managed programme has the advantage that information flows are easier to manage and local actions are more easily coordinated.

6 Bonferroni, Scheffe and Sidak tests (Hochberg & Tamhane, 1987), which all provide the same results, indicate that the only statistically significant difference in overall performance is between the average scores of the Convergence and the Cooperation objectives.

With regard to the *Non-discriminatory* and *Licence-free* principles, all Operational Programmes obtain the same scores. Every dataset in EU27 is publicly available with no requirement for registration, and a licence is never specified. On the contrary, the principles *Complete* and *Machine processable* show the highest variance and, as already said, are quite important in explaining the variation of the overall performance.

On average, the completeness of information provided is 42.2%, far below the 66% level (stage 2), which means that the ETI requirements are still far from being met.

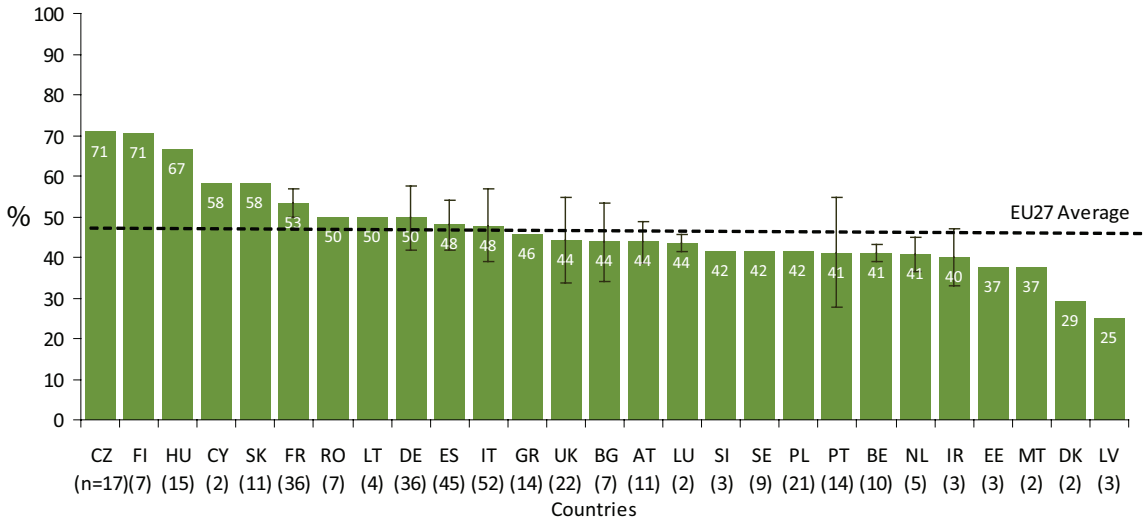
The two principles *Machine processable* and *Non proprietary* seem even more urgent to be applied. The way data are formatted and delivered makes a big difference. Government-produced reports, charts, and analyses can be very valuable, but *"it is essential to also publish the underlying data itself in a computer-friendly format that makes it easy for the vibrant community of civic technologists to make and share a broad range of tools for public engagement"* (Robinson, Yu and Felten, 2010).

For now, the situation is rather discouraging, with results showing very low scores for both principles (11.9% for *Machine processable* and 1.8% for *Non proprietary*). PDF is by far the most common format in which data is published, followed by XLS and DOC, while none of the programmes use data interchange formats such as XML or *linked data* formats such as RDF (Berners-Lee, 2006). The only open format actually used is CSV. This implies that data publicly available on Structural Funds are not really "open data" as commonly defined (see for example the Open Knowledge Definition[7] and Chernoff, 2010).

Better results are shown regarding the *Primary* principle. Most of the information on beneficiaries is presented at the highest level of disaggregation (that is, the beneficiary of funding), as required by the regulation. Otherwise, the information is provided in aggregated tables, which, by the way, can hardly be defined "lists of beneficiaries".

As for the *Timely* principle, it is quite common to find information on the day or month of last update as recommended by the European Transparency Initiative (stage 2). However, the stage 3 (declaration of the update frequency) is almost never reached.

Graph 1 - Average scores and standard deviation of the Operational Programmes of EU27 (Cooperation objective not included), by Member State



7 http://www.opendefinition.org/okd/

Finally, the results show a considerable variation in the overall quality of data among Member States. Best performing countries such as the Czech Republic and Finland obtain a score of 71%, while the worst performing Member State is Latvia with 25%.

It is worth noting that countries from the eastern Europe often appear in the first half of the chart. A possible explanation for this may rest in the specific actions and positive influence that the DG Regional Policy of the European Commission has exerted on these countries during the last few years in the official Monitoring Committees.

The chart also illustrates the disparities within the Member States by showing the standard deviation of the scores obtained by each country. As explained before, the variation equals zero in presence of an integrated information system at the national level. Portugal shows the highest dispersion from the average (13.5%), followed by the United Kingdom (10.5%), Bulgaria (9.6%) and Italy (8.9%).

7. Conclusions and policy recommendations

This empirical study, based on indications of previous studies and on existing evaluation schemes, is the first attempt to compare transparency of the Cohesion Policy across Europe and could represent a first step in developing a new European benchmarking framework aimed at comparing European countries in terms of the availability and quality of Open Government Data provided.

Structural Funds are the ideal context for testing a new methodology for Open Government Data evaluation because they involve all Member States and regions with common rules and regulations and influence national and regional policies and strategies, and so they play a pivotal role in spreading the administrative culture of transparency and openness across Europe.

The results of this web-based survey show that the European Cohesion Policy is only halfway to accomplishing a paradigm shift to open data, with differences in performance both between and – in some cases - within European countries.

Low scores are attributed to the formats the authorities are choosing when publishing their data on the web, while other indicators such as the level of granularity are positively influenced by the requirements of current regulations.

The use of open, machine-processable and *linked-data* formats have unexpected advantages in terms of transparency and re-use of the data by the public and private sector. These aspects are already highlighted in the current e-Government Action Plan, in the European Directive on the re-use of Public Sector Information and in the Open Government policies that are being implemented in many OECD Countries around the world.

The application of these technical principles does not need extra budget or major changes in government organisation and information management; nor does it require the update of existing software and infrastructures. What is needed today is the promotion among national and local authorities of the culture of transparency and the raising of awareness of the benefits that could derive from opening up existing data and information in a re-usable way.

As demonstrated, in Cohesion Policy implementation a key role is played by the regulations and the consequent actions that the European Commission or the national authorities should put in place. In this regard, the evaluation scheme proposed sets of specific targets in terms of quality, openness

and completeness that could be considered as possible requirements for the next funding period. For example, Managing Authorities of Structural Funds should:

- use only open and machine-processable formats. In particular, the linked data paradigm should be adopted
- provide a comprehensive description of the data including information on the frequency of update
- improve the data accessibility by sharing it with other administrations so as to develop new and larger data-sets enabling direct comparisons between countries.

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Open Linked Data to Inform Policy and Improve Services

The Linked Data approach provides a way of publishing government data to make meaningful interpretation possible. It allows joining up of information from different organisations to facilitate collaboration. It lets non-government organisations, including businesses and pressure groups, produce fresh insights.

The paper summarises the main techniques of Linked Data and why those techniques lend themselves to an evolutionary approach to information sharing. It describes applications of Linked Data in the UK in line with the UK Government's transparency agenda. Challenges to the adoption of Linked Data are presented.

The paper concludes by highlighting the potential of Linked Data to improve evidence-based policy making. It recommends that policy makers encourage use of Linked Data and consistent use of URI sets across government organisations.

Mike Thacker

UK electronic service delivery toolkit

Keywords

Linked data, evidence based policy, esd-toolkit, ADD ME, Smart Cities

> "Early adopters are driven by a vision that benefits will follow from a gradual snowballing of data linkages. This linking will bring fresh insights and remove time-consuming subjective selective re-purposing of information."

1. Introduction

Linked Data provides an extensible means of opening up government in a way that makes information re-usable and puts public and private data consumers on an equal footing. It can allow correlations between datasets to be tested so that policy can be driven more by evidence.

High level UK government policy is to make structured data easily available to enable scrutiny from outside government. Early examples of open Linked Data in the UK public sector can be seen at data.gov.uk, legislation.gov.uk and esd-toolkit.

Consultation across Europe resulting in the Citadel Statement of December 2010 shows open data is a high priority for the public sector.

The potential for Linked Data to revolutionise evidence-based policy making will be put to the test by work in the UK in 2011. For it to succeed, the groundwork of enthusiastic visionaries needs to be followed-up by civil servants who see improved insights and lower costs resulting from a collective intelligence built around Linked Data.

This article explores the potential of using Linked Data techniques to better understand and to improve service provision by the public sector. It explains what Linked Data is, what it offers over other ways of opening up government, achievements to date in the UK and factors that will influence the widespread adoption of Linked Data.

The article focuses primarily on work in the UK that contributes towards the UK Government's Commitment to Transparency[1]. However that work helps support the EU eGovernment Action Plan[2] by providing a model for collaborative work between government organisations, businesses and citizens by connecting up their data.

2. Open Government and Linked Data

Open government is widely promoted and enforced for most categories of non-personal information in the UK by the Freedom Of Information Act[3]. Providing isolated pieces of information on request under an FOI request can address enquiries as to the propriety and professionalism of a body. However this approach does not readily lend itself to more robust analysis of public services. For such analysis data are required, often from more than one organisation that allows correlation between possible causes and effects, e.g. data that let one test for a relationship between the provision of libraries and literacy levels.

To establish trends and correlations, government needs to provide data. For that data to be useful beyond the limits of the source organisation the data need to be linkable to data from other organisations. Hence methods need to be employed that permit easy linking beyond organisational boundaries.

The UK public sector drive is towards fewer government websites and greater provision of data for re-purposing (i.e. using for purposes other than those for which the data was originally intended) by non-governmental organisations, including private sector companies. This approach brings a cost saving in terms of website maintenance and allows for analysis of information by specialist interest

1 UK Prime Minister's Office Web site Transparency page http://transparency.number10.gov.uk/

2 European Commission Information Society ICT for Government and Public Services Action Plan 2011 — 2015 http://ec.europa.eu/information_society/activities/egovernment/action_plan_2011_2015/index_en.htm

3 UK Freedom Of Information Act http://www.legislation.gov.uk/ukpga/2000/36/contents

groups which may add different insights from formal policy-making organisations.

Non-personal information, including information that has been made non-personal via aggregation, lends itself to openness. Examples of such information include: budgeted and actual spending; demographic data; details of legislation; service access points. Much of this information has already been put into the public domain in various formats. If expressed as Linked Data it can more readily be re-used.

3. Linked Data Fundamentals

Techniques fundamental to Linked Data, which make it suitable for the Web and distinguish it from other approaches to sharing data are described in brief below.

3.1 Relationships are Expressed as Triples

Linked Data uses *triples* to express relationships between two things. A triple comprises a *subject*, a *predicate* (sometimes known as a *property*) and an *object*. For example: a service addresses a need.

Figure 1: a service addressing a need

More specifically, a particular service (e.g. sheltered housing) addresses a particular need (e.g. the need for shelter).

Figure 2: a particular service addressing a particular need

Databases of Linked Data are known as *triple* stores. An *ontology* describes the triples one might expect when publishing a particular dataset.

3.2 Everything has a URI

Each of the three parts of the triple is expressed as either a literal value (e.g. text or a number) or as a Uniform Resource Identifier (URI). Each URI is globally unique and normally created in the format of a web address that can be looked-up (known as de-referencing) in a standard web browser.

So in the above example these URIs may be used:

- Sheltered housing service: http://id.esd.org.uk/service/103[4]

4 URI for Sheltered housing service: http://id.esd.org.uk/service/103

- The predicate "addresses need": http://def.esd.org.uk/addressesNeed[5]
- The Need for shelter: http://id.esd.org.uk/need/44[6]

The W3C document Cool URIs for the Semantic Web (Sauermann et al., 2008) and the UK document Designing URI Sets for the UK Public Sector (UK Chief Technology Officer Council, 2010) describe rules for applying URIs.

The advantage of the URI is that it brings precise meaning so that it is clear if something referred to in two different datasets is genuinely the same thing. For example definitions of "child" differ between government organisations and different services. Likewise, more precise definitions of gender may be required for health provision (where biological gender is important) than for other public services (where a simple male or female classification suffices).

When the same URI is used in two datasets, links can be made across those datasets. For example, a dataset describing the cost of delivering a service can be linked to another dataset on the efficacy of that service in meeting a policy objective.

3.3 Lists can be Published using SKOS

The W3C Simple Knowledge Organisation System (SKOS) (Miles & Bechhofer, 2009) provides a Linked Data way of publishing lists used to categorise things. SKOS is typically used for lists of non-tangible things like types of service or customer classifications. Such lists are important because they provide a means for people to look up and use the same URIs for the same concepts – hence making linking possible.

3.4 Linked Data Can Be Queried Using SPARQL

SPARQL is a language used to query Linked Data held in a triple store in the way that SQL is used to query data in a relational database. SPARQL can return data joined by common URIs. SPARQL may be used across multiple triple stores over the Web or within one aggregated triple store into which Linked Data has been copied from multiple stores.

4. Linked Data Is An Open Approach

The characteristics of Linked Data described above make it particularly suitable to sharing information without the need for a highly structured, centrally controlled regime.

Linked Data does not require the structure of two datasets to match. It simply allows for links to be made if the same URI appears in different datasets. It is therefore not a highly proscriptive approach. It lends itself to an evolution whereby more and more datasets become aligned when literal values are replaced with URIs, and common SKOS lists (e.g. for services, health conditions, spending categories) emerge as the power of sharing definitions is recognised. SPARQL lets people make queries that traverse multiple open datasets which share URIs.

Triples are self-documenting, unlike other types of published data that need separate schemas or textual explanations to be interpreted.

Links can be established between datasets by anyone who chooses to publish data using other people's

5 URI for the predicate "addresses need": http://def.esd.org.uk/addressesNeed
6 URI for the Need for shelter: http://id.esd.org.uk/need/44

URIs. Organisations consuming the data need to make a judgement on its quality. Judgements can be informed by data properties that indicate who the publisher is and the professed data quality. However consumers can make their own judgement and then can mix and match data from government and non-government sources as they see fit.

5. What Government Data have been Published?

Through 2009 and 2010, disparate parts of the UK public sector have published Linked Data in response to a government drive led by the Prime Minister (The Guardian, 2011) to make data more accessible. There is no consistent approach to publishing across government departments, but there is a general drive to issue data as it becomes available. Data consumers are at liberty to identify and make use of links between datasets and develop their own applications.

5.1 Data.gov.uk

The data.gov.uk[7] website was launched in January 2010. It brings together links to thousands of datasets issued by UK government bodies. It articulates the principles of open public data[8] including that:

"anything published on Government websites should be available as data for others to reuse. Public bodies should not require people to come to their websites to obtain information."

Whilst only a small proportion of the datasets published at data.gov.uk is expressed as Linked Data, the site promotes the Linked Data approach and provides tools for analysis of datasets that use it.

An Open Government Licence For Public Sector Information[9] has been published under which public sector organisations can publish their data.

5.2 Legislation.gov.uk

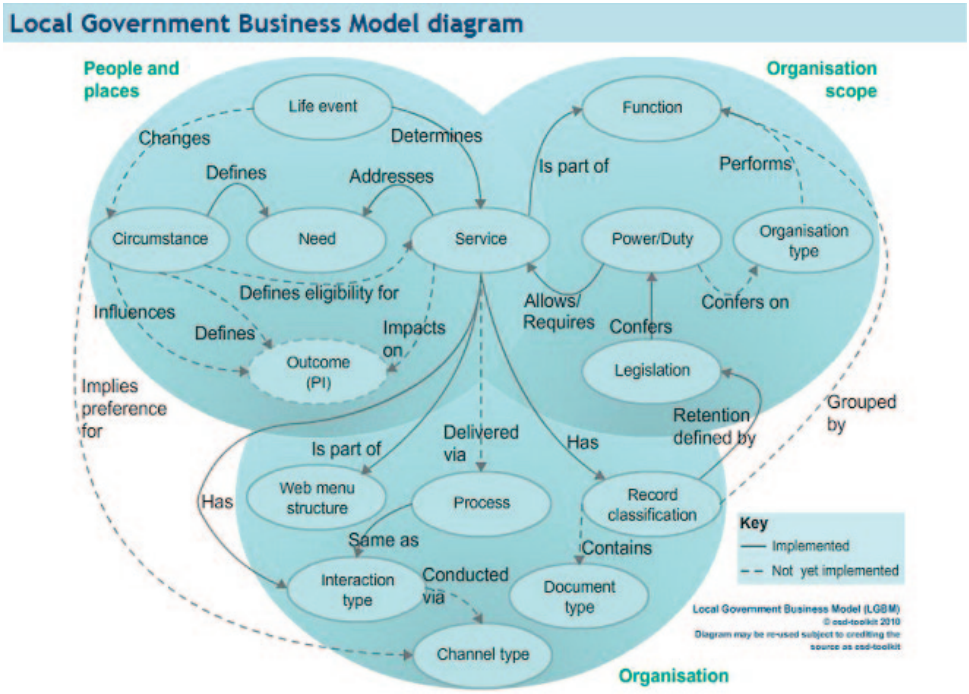
Legislation.gov.uk[10] publishes all UK primary legislation from 1988 (with the exception of some associated documents) as Linked Data.

5.3 Esd-toolkit

In local government the electronic service delivery toolkit (esd-toolkit[11]) publishes the Local Government Business Model (LGBM[12]) naming the elements of public sector service delivery (e.g. services, circumstances, citizen needs, business processes) as a set of SKOS lists with associated Linked Data.

7 data.gov.uk http://data.gov.uk/
8 The principles of open public data http://data.gov.uk/blog/new-public-sector-transparency-board-and-public-data-transparency-principles
9 An Open Government Licence For Public Sector Information http://www.nationalarchives.gov.uk/doc/open-government-licence/
10 Legislation.gov.uk http://www.legislation.gov.uk/
11 electronic service delivery toolkit (esd-toolkit) http://www.esd.org.uk/
12 Local Government Business Model (LGBM) interactive diagram http://standards.esd.org.uk/LGBMDiagram.aspx

Figure 3: Local Government Business Model



The model includes lists for defining three types of information:

1. the customers of government, their circumstances and needs, so data can be analysed with a view to better targeting of services
2. which government organisations deliver services in which areas, so data analysis might bring streamlining across organisations
3. the processes used to deliver services, so that processes can be compared to highlight opportunities for greater efficiency and checked for completeness

From LGBM, esd-toolkit is building links to URIs from different parts of the model. Some examples are:

1. Legislation (from legislation.gov.uk) that confers on a local authority the power or duty to deliver a service
2. Local government web pages for each service
3. Customer profile breakdowns by service
4. Indicator statistics by geographical area or local authority

5.4 CIPFA

The Chartered Institute for Public Finance and Accounting (CIPFA) has published as SKOS lists the spending categories[13] against which local authorities are required to categorise spending. These lists make it possible to use Linked Data techniques to join financial data from disparate sources via

13 Chartered Institute for Public Finance and Accounting (CIPFA) has published as SKOS lists the spending categories http://doc.cipfa.org.uk/CipfaLists.aspx

widely recognised category headings.

5.5 Payments Ontology

The UK Government has asked all councils to publish spending of £500 or over from January 2011. (The sum of £500 is somewhat arbitrary and just indicates that details of all non-trivial payments should be published.) Data.gov.uk hosts a payments ontology[14] with guidance[15], which provides a recommended way of publishing spending information as Linked Data, using the CIPFA category URIs.

5.6 European Service Lists

The European Union North Sea Region[16] Smart Cities project[17] has published a list of local government functions[18] and draft lists of services[19] provided by municipalities in each partner country as SKOS lists. The lists link service names across national boundaries and so provide a framework for civil servants in one country to reference materials and data published in another.

Figure 4: EU local government functions list & Smart Cities list

5.7 Sharing Projects, Innovation and Case Studies via Linked Data

The UK Department for Business, Innovation and Skills and the Department for Work and Pensions are driving a pan-government programme known as "Spark"[20] for discovering and sharing innovation. In conjunction with esd-toolkit they have defined a template for describing projects[21], innovations and case studies. The template is also published as a Linked Data ontology[22]. It recommends use of standard Linked Data lists of headings (such as those maintained in LGBM) for categorising projects.

esd-toolkit is publishing an open source software application for displaying and updating projects directly from any triple store where they are held as Linked Data. Instances of the application can

14 Payments ontology http://reference.data.gov.uk/def/payment
15 Payments ontology guidance http://data.gov.uk/resources/payments
16 North Sea Region http://www.northsearegion.eu/
17 Smart Cities project http://www.smartcities.info/
18 EU local government functions list http://id.esd-toolkit.eu/FunctionList/
19 Draft EU list by Smart Cities partner country http://standards.esd-toolkit.eu/Lists.aspx
20 UK pan-government Spark project http://sparkdev.co.uk/
21 Template for describing projects http://purl.org/project/def.doc
22 Linked Data ontology for describing projects http://purl.org/project/def

be styled to match host websites while underlying data have a standard structure. Data input to one store can be read by another and so appear in multiple project registers without complicated data conversion or manual re-entry. Project properties can be added for local requirements without impairing the ability to share.

esd-toolkit has converted the solutions 4 inclusion[23] tool to use the Linked Data projects application, whilst keeping its original look and feel. Solutions 4 inclusion lists more than 800 projects aimed at helping the socially and digitally disadvantaged. Spark is committed to putting out Linked Data for central government innovations. Further project registers are being updated to use the Linked Data approach. The pan-European ADD ME![24] (Activating Drivers for Digital Empowerment in Europe) project will use the Linked Data application for sharing expertise.

6. The State of Play - How well is Linked Data being used?

Data.gov.uk lists more than one hundred third-party applications that add value to public datasets. Typically these applications make use of common geography; for example a mobile application has been developed to show the level of Anti-Social Behaviour Orders (i.e. civil orders made against a person who has been shown to have engaged in anti-social behaviour) issued in the user's current location. Relaxation of licensing on UK map information has made development of map-based applications more viable for non-government organisations.

Cases of Linked Data being exploited and links made on something other than geographical location are rarer. The "powers and duties" links between local government services and legislation is one example.

Commercial applications are being developed from legislation.gov.uk.

It is early days and many of the foundations have been laid for links to be established. Signs of forthcoming increased adoption include:

- The drive for local government to publish spending information from January 2011 with at least one major finance system supporting direct output to Linked Data.
- Widespread interest in the common template and application for sharing projects and case studies as Linked Data.
- UK Local Government Group plans to publish metric definitions and statistics as Linked Data in the first half of 2011.

Diverse private sector organisations and community groups have shown an appetite for consuming data. The principles of public sector data demonstrate a high level political commitment in the UK to publish it.

At the European level, the Citadel Statement[25] launched at the end of the Belgian Presidency in December 2010 puts Open Data second in a prioritised list of requests to decision makers for the improvement of local eGovernment following extensive consultation across Europe.

The new UK government from May 2010 has championed transparency and its Department for Communities and Local Government published in February 2011 a Code of recommended practice

23 Solutions 4 inclusion http://www.esd.org.uk/solutions4inclusion/
24 Pan-European ADD ME! project http://epractice.eu/community/addmecommunity
25 The Citadel Statement http://www.smartcities.info/files/Citadel Statement.pdf

for local authorities on data transparency (UK Department of Communities and Local Government, February 2011). The document, issued for consultation, recommends publication of structured data and use of URIs.

7. Some Challenges to Publishing Open Linked Data

A shift towards publishing raw data that can be accurately interpreted removes direct power from civil servants and the politicians they serve. By providing just data, a government organisation leaves others to make their own judgements. It has no control over the analyses made and conclusions drawn. Hence power is transferred to the armchair auditor, the academic, the political pressure group and to commercial interests.

Publishing lots of data can lead to increased Freedom Of Information requests in order to clarify meaning. But use of Linked Data with de-referencable URIs reduces scope for data misinterpretation and the need for further clarification.

Transferring the scrutiny and policy-analysis role to external data consumers reduces the need for in-house analysis and communication experts. Analysis across government sectors is easier as Linked Data is more widely adopted.

For one government organisation to be motivated to open up its data, it needs to gain value from links made by other (government and/or non-government) organisations. Early adopters therefore find this value hard to identify. They tend to be driven more by a vision that benefits will follow from a gradual snowballing of data linkages. This linking will bring fresh insights and remove time-consuming subjective selective re-purposing of information.

8. Conclusions

Open Government through publishing of Linked Data puts into the hands of anyone who chooses to take up the data, the power to analyse how effective policy is and to make new discoveries. The Linked Data approach offers a means of evolving linkages between information held by disparate government and non-government organisations.

By publishing their information as Linked Data and starting to use one another's URIs, organisations can migrate towards a more co-operative way of working and glean insights from testing correlations between one another's data.

In the UK many of the foundations have been laid and high level policy dictates that information should be freed up in this way. On the ground small achievements have been made but many decision makers have yet to be sold on the approach. It will become clear during 2011 as to whether the ground work done will be followed up to bring a revolution in information analysis and informed policy making.

Policy makers can aid a transition to Linked Data by:

- Requiring information to be published in structured machine-readable ways – particularly as Linked Data in triple stores with open access
- Encouraging and aiding consistent use of URI sets across government organisations

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The Impact of Localisation on Semantic Web Standards

In this paper we focus on two fields: i) information content globalisation, internationalisation, localisation, translation (GILT) and ii) Semantic Web (SW). We focus particularly on open standards, firstly in general, describing their advantages and disadvantages, and then specifically on open standards of these two fields. There is need for open standards with explicit semantic metadata in GILT and also for multilingual support in Semantic Web standards. For example, when comments, i.e. non-translatable content, are confused with the translatable content, this is a SW gap.

The goal of our research is to describe on which levels interoperability can take place between GILT and SW. Interoperability between open standards in these two fields is necessary and crucial for a Multilingual Semantic Web (MSW). MSW exists already, as the provision of multilingual ontology-based resources or recycling of thesauri in multilingual ontologies prove. However, MSW as such (and not the resources or technologies) is something relatively new, and it has limitations. Our research contribution is to recognise these limitations and find potential and viable solutions.

In an e-Government context, and specifically in Government-to-Consumer (G2C) and Government-to-Employees (G2E) relationships, tools and technologies should be based on open standards to attract more actors, enhance competitiveness, and improve interoperability. We focus on information and communication technology (ICT) at an international and not local or regional level. By definition, localisation is the adaptation of digital content to a target locale (combination of language and culture). In order for the digital content to be international in public sectors, it should be localised in other languages (see GILT), apart from English, to allow non-English speakers to search, find, and structure (see SW) relevant public information.

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> “There is need for open standards with explicit semantic metadata in localisation and multilingual support in Semantic Web.”

1. Introduction

The Semantic Web is the extension of the World Wide Web that enables people to share content beyond the boundaries of applications and websites[1]. The term 'Semantic Web' was coined by Tim Berners-Lee et al. (2001). Multilinguality in Semantic Web means multilingual ontological systems, multilingual semantic tools, multilingual search engines, and so on. When these are missing, then it is a non-multilingual Semantic Web. Generally speaking, a lack of multilinguality means that only one language, often the lingua franca English, is a basic ingredient in all computationally linguistic resources. Accordingly, research is monotone and limited, as linguistic phenomena of other languages are not taken into account and relevant software and hardware covering multilingual aspects are not being developed. In the e-governmental context, it means fewer actors participating, excluding non-English participants and/or enforcing them to use English for different purposes. Publicly accessible information services should be available in languages apart from English to cover a wider target audience.

Undheim and Friedrich (2008) pointed out that:

Sharing pieces of technology and turning them into a standard facilitates (global) market access and opens opportunities for new businesses, both large and small, not only in the software development area but, for instance, to a large extend in the services sector.

Daddiecko (2004) explored the benefit of ontologies for improved retrieval of subject domain knowledge through his study of building an ontology for export controls. He states that e-Government systems hold great potential for circumventing past information management deficiencies, and ontologies have a role in the transition from information systems to knowledge systems. The benefits of developing ontologies for e-Government systems are to centralise and reuse critical knowledge, share domain knowledge across a variety of settings within organisations, across organisations nationally, and within communities of practice that extend across borders, and preserve this knowledge.

A recent relevant initiative is the project EnAKTing[2] which is in the process of transforming datasets from UK government data into linked data[3] and to create simple and useful visualisations that everyone can explore. These datasets include the UK Parliament Dataset, the UK Crime Dataset, the UK Population Dataset, and so on.

Moreover, Nishio et al. (2010) carried out an empirical study examining public access information websites in Ireland in order to see how many languages were covered. The overall results of the study seemed to point to some weaknesses in the provision of information to those who do not speak English or Irish, although they statistically constitute a considerable portion of the implied receivers. The Citizens Information Board website supported only the official languages (English and Irish), with a few exceptions. The Departments of Enterprise, Trade and Innovation and Communications, Energy and Natural Resources do not provide a language selection for the Irish language. The Department of Social Protection provides 'Social Welfare Services Information' as separate documents under 'Services in other languages' (English, Irish, Arabic, Chinese, French, Polish, Portuguese, Romanian, Russian and Spanish). However, its customer charter does not mention languages for the provision of services while the rest of the 15 websites declare their provision of services in the Irish language in their customer charters. Nishio et al. (2010) concluded that the marginalisation of minorities causes trouble in the future. In a multinational, multilingual, and unified society, providing basic

1 http://semanticweb.org/wiki/Main_Page, February 16, 2011
2 http://www.enakting.org/, February 16, 2011
3 Linked data refers to RDF and related technologies for enabling data to be published in a decentralised fashion on the Web.

information for living must be considered crucial, particularly for newcomers and new members. It is precisely in this e-Government context that language policy and technology should work together for the common goal of information accessibility in a multilingual society.

2. Requirements, Pros and Cons of Open Standards

It is difficult to clearly define open standards, as for a specific domain, person, or company, it means different things. We adopt the definition of the Digital Standards Organization (DIGISTAN[4]) which states that:

An open standard must be aimed at creating unrestricted competition between vendors and unrestricted choice for users.

According to the 'Open Source Initiative'[5], the requirement for open standards is the following:

[Open standards] must not prohibit conforming implementations in open source software.

More precisely, the criteria an open standard must satisfy are the following:

i. No intentional secrets;

ii. Availability;

iii. Patents;

iv. No agreements;

v. No open standards requirements (OSR)-incompatible dependencies.

Open standards must be freely and publicly available (point ii above), provide all necessary information for interoperable implementation (i), and also, all technologies required for the implementation of the standard should be OSR-compatible (v). Moreover, there are requirements for all patents essential to implementation of the standard (iii), and there must not be any requirement for execution of a license agreement (iv).

Apart from the public benefit corporation 'Open Source Initiative', a not-for-profit organisation related to open standards is 'OpenStandards.net'[6]. OpenStandards.net connects people and standards-setting organisations and integrates various resources within the IT industry in favour of international IT collaboration. The relationship between open standards and innovation is stated by OpenStandards.net:

Open standards is a means to increase unity and sharing to decrease duplication. With insatiable demand for improvement, competitive innovation will always have a place, and become more productive as it is able to leverage a global infrastructure built on unity and openness. The greater the optimization and accessibility of the infrastructure built through open standards, the greater the demand for innovation leveraging it.

In other words, replicated standardisation efforts can be avoided through a unified infrastructure. This infrastructure should have the characteristics of innovation, open access, and information sharing. Open standards are adopted as far as there is improvement and optimisation. There are

4 http://www.digistan.org/text:rationale, October 19, 2010
5 http://opensource.org/osr, October 19, 2010
6 http://www.openstandards.net/viewOSnet3C.jsp?showModuleName=about, October 19, 2010

also other open standards-related organisations, such as the Open Group[7], Foundation for a Free Information Infrastructure[8] and others.

According to our opinion, open standards have both benefits and shortcomings and in the next paragraphs we shed light on both of them. As far as the benefits are concerned, open access is the most important one. Everybody, from information publisher or tool provider to end-user can have access to the standard. This provides equality to every actor and unrestricted choices in information science field. Apart from the 'open access' benefit, 'customisation' is another benefit of open standards. Actors can adapt the standard using custom extensions according to their needs and preferences. A third important benefit is the transparency of process. Every standard is open to the public for review before it is published. This allows for adaptation from the standardisation committee taking into account feedback and personalised requirements of the actors/users.

According to Multilingual Web[9] project, standards enable interoperability of data (see Section 3) and improve the efficiency of processes for producing, localising, and disseminating information. Moreover, standards provide targets that push applications to consider the requirements for supporting multilingual aspects of the Web for creation, display and management of content.

As for the drawbacks of open standards, often there is lack of awareness. It should be mentioned here that lack of awareness of standards is not only related to open standards, but to 'closed'/proprietary standards as well. The difference is that in the latter case, people have to use these proprietary standards, and that is why they are known, but only to a specific group. In the former case, open standards are not tied to a specific software, and that is why fewer people might be familiar with them, but more people interested in open standards have the potential to get to know them. In a nutshell, the difference is between can know (open standards) and must know (closed standards).

In fact, many people are not familiar with some open standards even though they may have existed for many years. In our survey (Anastasiou, 2010), 17% had heard of XLIFF (XML Localisation Interchange File Format), but they were not really aware of its functionality, although it has been available since 2002.

Another drawback of open standards is 'extreme customisation'. We referred to customisation previously as an advantage, but in fact, it is a 'double-edged sword'. When used between accepted borders, it can be an advantage, but when used to an extreme, then it turns into a disadvantage. Often developers customise the standard to an extreme extent, so that the standard gets various forms, the so-called 'flavors'. Some flavors often have no resemblance to the original proposed rigid structure of a standard. These various flavors have as impact different tool support of the same standard, which hinders interoperability. That means that a file created with a specific application can be corrupted when used later by another application.

In the next paragraphs we refer to some specific examples both from the field of globalisation, internationalisation, localisation, translation (GILT) and of the Semantic Web, and then we propose a symbiotic relationship between them. The term GILT is coined by Cadieux and Esselink (2004) and stands for globalisation, internationalisation, localisation, translation. According to the Localization Industry Standards Association (LISA)[10]:

Globalization involves changing the way an organization does business. [It] is more than a technical process and involves both internationalization and localization.

7 http://www.opengroup.org/, October 26, 2010
8 http://www.ffii.de/wiki/offenestandards, November 3, 2010
9 http://www.multilingualweb.eu/en/about-the-project, February 2, 2011
10 http://www.lisa.org/What-Is-Globalization.48.0.html, October 27, 2010

More specifically, globalisation is the strategy of bringing an internationalised and localised product or service to the global market; thus globalisation involves sales and marketing.

Now we state the definition of internationalisation according to LISA:

Internationalization encompasses the planning and preparation stages for a product in which it is built by design to support global markets.

In other words, internationalisation makes sure that the product or service is functional in any language and content. LISA states that when a product is not properly internationalised, it takes twice as long and costs twice as much to localise the product. Internationalisation is about making a product easily localisable. LISA defines localisation as follows:

Localization refers to the actual adaptation of the product for a specific market. It includes translation, adaptation of graphics, adoption of local currencies, use of proper forms for dates, addresses, and phone numbers, and many other details, including physical structures of products in some cases.

To sum up, the global product developing cycle starts with internationalisation (design and development) and continues with localisation (actual adaptation to a target locale). Globalisation is concerned with marketing support and product requirement analysis. Globalisation, internationalisation, and localisation include more tasks than the transfer from one language to another, namely translation. Project management, engineering, testing, marketing, and other tasks are parts of the global product developing cycle.

As far as the predominance of English in software localisation is concerned, Esselink (2000, p.4) states that approximately 80% of software products are localised from English into other target languages; as an example of the predominance of the USA in the area of localisation, one translation and localisation company[11] adapted the original LISA definition (i) of localisation to read as in (ii):

i. Localization involves taking a product and making it linguistically and culturally appropriate to the target locale (country/region and language) where it will be used and sold.

ii. Localization involves taking a product and making it linguistically and culturally appropriate to the target locale (country/region and language) where it will be **U.S.ed** and sold.

As GILT is a vast field including many sub-tasks, the existence of standards is necessary to achieve unity and data sharing. Open standards, in addition, provide bigger adoption potential, transparency, and regular updates and improvement.

Among others, some important GILT open standards follow. The following standards are representative of a domain and are also well-known in this and other domains. They are open because they fulfil all the requirements presented in Section 2.

i. Internationalization Tag Set (ITS) by W3C;

ii. Translation Memory eXchange (TMX) by LISA;

iii. Terminology DataBase eXchange (TBX) by LISA;

iv. XML Localisation Interchange File Format (XLIFF) by the Organization for the Advancement of Structured Information Standards (OASIS).

11 http://www.lztranslation.com/localization.html, November 15, 2009.

As some of the standards' names imply, the ITS (i) relates to internationalisation and XLIFF (iv) to localisation. TMX and TBX (standards ii and iii) are concerned more with digital content maintenance by means of Translation Memories and Terminology Databases. Although they might seem not strictly tied with localisation, they facilitate content reusage and leverage, and terminology consistency, which are crucial steps in the localisation process. We describe briefly XLIFF, as achievement of interoperability between XLIFF and RDF is one of our goals (see Section 3). XLIFF joined OASIS in December 2001 and was standardised in 2002. XLIFF stores localisable data and carries it from one step of the localisation process to the other, thus allowing interoperability between tools. XLIFF is an intermediate file format, i.e. a file in an original format (txt, docx, xml) that can be converted into XLIFF and back to the original. OASIS is a not-for-profit consortium that develops, converges, and adopts open standards for the global information society. Some other OASIS standards are Universal Business Language, Cross-Enterprise Security and Privacy Authorization, and many Web Services-related standards.

OASIS is relevant to the e-Gov community, as it has an e-Government Member Section which serves as a focal point and platform for discussions of governmental and public administration requirements for e-business standardisation. It brings together representatives from global, regional, national, and local government agencies, who share a common interest in directing and understanding the impact of open standards on the public sector[12].

We now move to the field of the Semantic Web and the open standards available there, as these are needed for a Multilingual Semantic Web (MSW). The predominant open standard model is the 'Resource Description Framework' (RDF) by W3. RDF is a standard model for data interchange on the Web. It allows structured and semi-structured data to be mixed, exposed, and shared across different applications.

One of the main purposes of RDF is to declare machine-processable metadata. Apart from RDF, we present below some (and not all) other open standards under the big umbrella of the Semantic Web:

i. Web Ontology Language (OWL) by W3C;

ii. Simple Object Access Protocol (SOAP) by W3C;

iii. SPARQL Query Language for RDF by W3C;

iv. Web Services Description Language (WSDL) by W3C.

Noteworthy is the Web Services Interoperability organisation[13] (WSI) which establishes best practices for web services interoperability and standards across platforms, operating systems, and programming languages.

In the next section we try to define data and standards interoperability, inform about some ongoing localisation-Semantic Web initiatives, provide reasons for interoperability failure, and solutions to avoid it.

3. Interoperability

Generally speaking, the key to interoperability is the freedom to change between different software packages, platforms, and vendors. The goal of interoperability is, among others, to avoid data and metadata loss through aggregation, sharing, and exchanging information.

12 http://www.oasis-egov.org/, February 16, 2011
13 http://www.ws-i.org/, October 10, 2010

It is important to distinguish between two kinds of interoperability:

i. Interoperability between data based on standards;

ii. Interoperability between (open) standards.

These points are not as far away from each other as they may seem. Point (i) can be seen as the immediate outcome of (ii), thus if the (ii) is missing, (i) cannot exist either. As data are saved in file formats and many file formats are standardised, then the connection is very close. According to the Multilingual Web project, standards enable interoperability of data, which maximises the potential for access to information, and ensures longevity and usability of data.

Open file formats/standards go one step towards data interoperability. However, more steps[14] of interoperability can be made at different levels:

i. Clarify which standard is for which domain;

ii. Support the relevant standard(s);

iii. Conform with the specifications/not extreme custom extensions;

iv. Create XSLTs for conversions and 'translations' from one standard to another;

v. Provide open APIs and web services for better interaction between software programs.

Moreover, at a last stage, peer review, interoperability testing, or standards interoperability analysis can and should be carried out in order to achieve quality and interoperability assurance. It is needless to say that if developers support and conform with the specifications of each standard (ii and iii), then interoperability is mostly successful and the stage (iv) can become, in this case, redundant. Open APIs (v) are important, because they provide a consistent development platform and help sharing content.

If one of the above steps is not done properly or in an inefficient way, then interoperability failure between data – as a result of failure between standards – is inevitable. Specifically to XLIFF, an experiment between commercial tools and their mostly unsuccessful XLIFF interoperability can be found in Anastasiou & Morado Vázquez (2010). The main reasons for the interoperability failure in our experiment were version update, extreme extensibility, and lack of converters. Every application used a different converter, whereas there is a lack of open source converters. As for the extreme extensibility, the flavors we aforementioned pose an interoperability challenge, as new elements and attributes are introduced, which are not recognised by another application. The version update, although an advantage in itself, often is not considered by some applications, which leads to a lack of interoperability.

Now we focus on scenarios combining localisation and the Semantic Web. For the time being there is a lack of literature about a single actual proposal of a symbiotic scenario. Characteristically, Krieger and Schäfer (2010, p.588) point out that 'ontologies, on the one hand, and resources for natural language processing, on the other hand, though closely related, are often maintained independently, thus constituting a duplication of work'. However, there are some very interesting

14 These steps are not for open standards only, but for closed ones too. However, they are more applicable to open standards, because of more freedom and openness of related data which enable low-level experimentation.

related projects, such as the Multilingual Web[15] project, Flarenet,[16] META-NET,[17] and Monnet.[18] The Multilingual Web project contributes to better awareness of standards and best practices in the area of the Multilingual Web. Flarenet (Fostering Language Resources Network) creates a shared policy for language resources and technologies. META-NET builds the technological foundations of a multilingual European information society creating an open distributed facility for the sharing and exchange of resources (META-SHARE). Monnet combines Machine Translation and the Semantic Web for better cross-language information access and develops multilingual ontologies for networked knowledge.

Also, in 2010 the first Multilingual Semantic Web workshop was hosted at the 19th International World Wide Web Conference. Among its topics[19], was the use of ontologies for cross-lingual mapping, multilingual extraction, and user-profile enrichment.

The current state of the art, from the Semantic Web's side, is that ontologies are in most cases monolingual and mostly English. It is an arbitrary decision which natural language is used for describing the ontologies' contents. This is why ontologies' contents/labels should be translated and thus the term Ontology Localisation (Suarez-Figueroa & Gomez-Perez, 2008) was created: "Ontology Localization is the adaptation of an ontology to a particular language and culture". In other words, Ontology Localisation includes i) translation of ontology labels into another natural language other than its original and ii) adaptation of monolingual ontology labels to cultural characteristics, including spelling variations.

In localisation, from the other side, semantics is what is lacking in the existing open standards. XLIFF is an exception, as it carries heavy metadata, such as coordinates of dialogue boxes, file creation date, author details, and so on.

A common approach nowadays is the alignment of ontologies based on lexical properties of their labels, however often there is 'confusion' between data and metadata leading to an incorrect alignment. The metadata has nothing necessarily to do with the ontological content apart from describing it and this should be considered in the alignment.

As far as the multilingual use of semantic web, in 2005 Hahn and Vertan discussed how it can function:

i. Translation of websites can be supported especially through the use of ontologies;

ii. Knowledge management can also be improved through websites. Such an example is the development of resources for group, project or company knowledge, especially in multilingual form for international institutions;

iii. International communication base for industry and commerce is created. Such an example is international lists of products, names of products or custom regulations.

The third point is valuable for government policies. Digital public governmental content, services and products should be multilingual, at least in all official languages of the country, and preferably even in more, to attract more citizens and consumers.

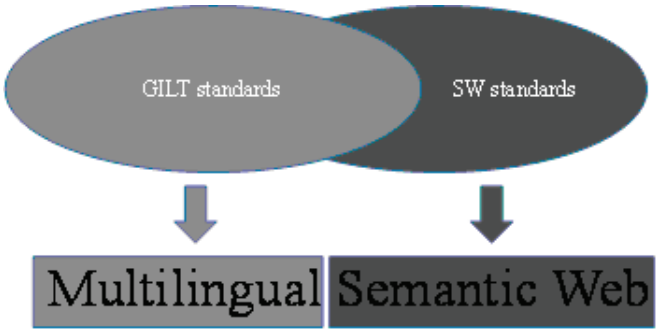
Additional to these three uses, the reasons of having a Multilingual Semantic Web are, among others, to have a more efficient named entity recognition, cross-lingual search, and Information extraction

15 http://www.multilingualweb.eu/en, October 20, 2010
16 http://www.flarenet.eu/?q=Vienna09_Session5, October 20, 2010
17 http://www.meta-net.eu/, November 07, 2010
18 http://www.monnet-project.eu/Monnet/Monnet/English?init=true, February 16, 2011
19 The proceedings of the workshop are available at: http://sunsite.informatik.rwth-aachen.de/Publications/CEUR-WS/Vol-571/, November 07, 2010

and Retrieval. Then the information aggregation and sharing in resources and international lists will be more efficient.

Our vision is a Multilingual Semantic Web which is based on open standards from Globalisation, Internationalisation, Localisation and Translation (GILT) and Semantic Web, as it is illustrated in Diagram 1. The semantic metadata of the former and the multilingual support of the latter can create an interoperable framework. The advantage of this framework-relationship is the creation, management, sharing and publishing of multi- and crosslingual resources in Semantic Web applications. Localisation has an impact on the Semantic Web in that the former enables multilingual support in the latter's applications. Localisation and Semantic Web data, tools, and their users can more easily and efficiently communicate without data and metadata loss. Standards, in general, provide a unified framework and are a means of supporting data, tools, and users' communication.

Diagram 1: Multilingual Semantic Web based on open standards



In this initiative based on open standards, we suggest the following methodology steps:

i. Internationalisation should be taken into account when standards are developed in the field of Semantic Web and semantics should be considered when GILT standards are created;

ii. Both Localisation and Semantic Web standards should have requirements which should be compatible with each other;

iii. Conformance clauses should include criteria about compliance with both Localisation and Semantic Web standards.

As far as point (i) is concerned, labels should be internationalised, i.e. easily localisable. Localisable content should be distinguished by the unlocalisable content and this should be clear in the ontology labels. The same holds for metadata, which in most cases should not be translated, but transferred as such.

In Localisation, metadata with explicit semantics, such as resource descriptions, links to external references, e.g. which glossary/dictionary/Translation Memory or Machine Translation technology has been used for a specific term, will help increase transparency, provide context, and evaluate quality.

Point (ii) is concerned with standardisation requirements. In Localisation, often one standard is a prerequisite for another, however, this is not yet the case for Localisation and the Semantic Web. A framework of a MSW will not be efficient if it is based on many standards, some of them with an inflexible structure with different requirements and thus purposes and uses. Common requirements of Localisation and Semantic Web standards and a potential single Localisation-Semantic Web standard is a basic step towards building the Multilingual Semantic Web framework. As the creation of a single

Localisation-Semantic Web standard is both complex and time-consuming, common requirements of different standards and conformance clauses which take into consideration different requirements of each field (point iii) is an initial step.

As for a practical implementation of the theoretical framework, we designed an XLIFF to RDF (XLIFF2RDF) conversion tool which translates XLIFF files into RDF representation. The converter is under the Mozilla Public License and is hosted on the Google code hosting[20] website. It is applicable in many domains and many tools. As XLIFF is an intermediate file, any file format which can be converted into XLIFF can be then converted to RDF. Hence interoperability between other formats (and not only XLIFF) and RDF is achieved.

4. Conclusions

Open standards and accordingly standards-based data interoperability is important for information aggregation and sharing. Although interoperability between standards should be the right path for flexibility, usability, open access and collaboration, often there are challenges which hinder this achievement. Localisation and the Semantic Web are not really connected yet, but both fields and their open standards have the potential to interoperate and gain advantage from each other. XLIFF can be used to translate ontology labels and in addition, ontologies can be populated with localisation metadata. Having started with an XLIFF2RDF open source converter, we intend to extend this interoperability connecting more open standards.

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Lifting off towards Open Government
A report from the EU Belgian Presidency Conference

This article summarises the main messages from the Lift-off towards Open Government Conference, held on 15-16 December 2010, organised by the Belgian Presidency of the EU Council. It aims to disseminate these messages to the research and practitioner communities and to contribute to the current policy debate on the prospects of e-Government, now being shaped and implemented on local, regional, national and pan-European levels. First, the article outlines the progress of the EU discourse on e-Government also providing a brief overview of the evolving academic debate on this domain. It then introduces the current policy framework for Open Government in Europe and worldwide and provides an analysis of the key policy challenges discussed during the Conference. It concludes with the main messages that emerged, and gives an overview of future prospects and the possible directions the policy agenda for a European Open Society could take.

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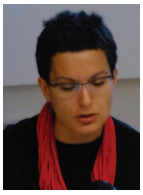

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Disclaimer:

The views expressed in this paper are purely those of the authors and may not in any circumstances be regarded as stating an official position of the European Commission.

Keywords

Openness, e-Government, policy, European Union

> “The European eGovernment Action Plan 2011-2015, launched during the Open Government conference, paves the way for the transition of e-Government into a new generation of flexible, seamless government services that will effectively empower citizens and businesses towards building an open, innovative and inclusive digital Europe.”

1. Introduction - Findings

The Lift-off towards Open Government Conference was organised by the Belgian Presidency of the EU Council and held on the 15-16 December 2010 in Brussels, in order to discuss the prospects of e-Government, now being shaped and implemented on local, regional, national and pan-European level.[1]

Following the 5th EU eGovernment Ministerial Conference in Malmö in 2009, organised by the Swedish Presidency of the EU Council,[2] the Belgian Open Government Conference was an important milestone in preparation of the forthcoming 6th EU eGovernment Ministerial Conference that will be organised by the Polish Presidency for November 2011.[3]

The Open Government Conference, preceded by a one-day event dedicated to Local e-Government, was attended by a total of 844 participants, 38% of whom came from the private sector, and 62% from the public sector. 60% were from Belgium and 40% from abroad. 15 press agencies and 5 TV crews were present at the Conference, where a total of 44 countries were represented.[4]

The Conference included an exhibition where around 40 exhibitors from public, private and third sectors showcased their projects and policy and research initiatives, and demonstrated best practices from the past decade. However, despite all the efforts and success stories, the exhibition also showed that e-Government is still work in progress. It could be said that Europe has only just begun to tap into ICT's potential for society and citizens.

David Broster, Head of the Information Society Unit of IPTS,[5] the official Conference rapporteur, supported by Gianluca Misuraca and Margherita Bacigalupo, Scientific Officers at IPTS, presented the main findings in the closing session.[6] These are summarised in this article which also provides further insights and ideas for future action.

2. A Decade of Joint Work on eGovernment

A look at the evolution of the e-Government agenda during the past decade and a glance through the Ministerial Declarations that started in Brussels in 2001 and have followed each Ministerial Conference since then (Como in 2003, Manchester in 2005, Lisbon in 2007 and Malmö in 2009). This clearly shows the changing political emphasis put on e-Government priorities.

1 http://www.opengov2010.be
2 MalmöSweden, 18-20 November 2009, http://www.egov2009.se/
3 The official eGovernment Ministerial Conference is organised every two years by the Presidency of the EU Council in collaboration with the European Commission. See http://ec.europa.eu/information_society/activities/egovernment/index_en.htm
4 Source: Official data provided by the Conference's organisers.
5 IPTS is one of the seven Institutes of the Directorate General Joint Research Centre of the European Commission. IPTS' mission is to provide customer-driven support to the **EU policy-making** process by developing science-based responses to policy challenges that have both a socio-economic as well as a scientific/ technological dimension. (See: http://ipts.jrc.ec.europa.eu).
6 See: http://www.opengov2010.be/sites/default/files/speakers/presentations/PL9-01-David-Broster.pptx

Figure 1: A tag cloud highlighting the keywords of the five Ministerial Declarations on e-Government, to visualise the evolution of concepts in the eGovernment agenda. Source: Authors' elaboration.

In 2001, e-Government is associated with words like "modernisation, reorganisation, access, participation". In 2003, new themes came in like "efficiency, transparency, measurement". The emphasis on "transformation, effectiveness, inclusion, identity and exchange of best practices" started in 2005 in Manchester and was subsequently embodied in the i2010 eGovernment Action Plan (European Commission, 2006). In Lisbon (2007), "innovation and cross-border interoperability" were added, and finally, by Malmö, the agenda had moved on to "engagement, openness, quality of services and user needs".

In the early 2000s, the ambition was to bring governments online to grant all citizens multi-channel access to public services. ICT was seen as a readily available set of tools that would facilitate public sector modernisation, thus improving service delivery. Almost as a side effect, inclusion would be ensured and greater participation encouraged. Progressively, sights were set higher towards the reduction of administrative burden in order to free resources to deliver more value for tax-payers' money and to enhance productivity by leveraging on efficiency.

Over the same period, the importance of cross-border usage of emerging solutions gradually shifted from the exchange of good practices to cooperation, joint action and knowledge sharing to deploy interoperable cross-border electronic identity and authentication systems. Interoperability has gradually become the pivot for seamless cross-border e-Government services intended to enable citizen and business mobility and to remove procedural barriers to the Single Market.

Provided that delivery of inclusive public services for all never disappears from the list, citizens (and businesses) will progressively stop being passive recipients of services and become more active stakeholders. Initially they were encouraged to participate in policy definition and decision-making processes through consultation mechanisms. But their involvement has gradually grown to the point where they are starting to be recognised as co-designers of public services and active stakeholders in the generation of public value.

To sum up, there has been a steady shift from a back-office to a front-office focus. The unprecedented growth of ICT use has compelled a transformation towards openness and engagement. However, it is widely accepted that this transformation lags behind the Web2.0 phenomenon, that arrived on the scene in the middle of the first decade of 2000s, now becoming the 'new normal', as convincingly shown by Peter Hinssen, a visionary speaker at the Conference.[7]

To paraphrase Hinssen's concept, Open Government will be the norm in the future, but this transformation will be brought about more by behavioural changes than by ICT. We are already witnessing many changes in our daily lives, and personal and professional attitudes. This can especially be seen in the way the young people integrate their digital and real selves, or how social networks and user-generated content is used and consumed (if not abused). However, we are only halfway through the digital revolution. Much more needs to be done, more than ever from a public sector organisational perspective, to institutionalise changes and ensure that a new generation of ICT-enabled public services become beneficial for citizens.

3. An Overview of the Evolving Academic Debate

e-Government policy in Europe has developed in line with its theoretical evolution in the academic and research community, where it has seen similar changes of emphasis. Since the 1990s, the systemic introduction of ICT into governmental operations has given rise to the concept of e-Government. This has numerous labels: e-Gov, digital government, e-administration, online government and, in certain contexts, transformational government, each of which reflects different priorities in government strategies. The term 'e-Government' has been diversely defined by different scholars and other stakeholders. In the narrow sense, e-Government indicates a system of effective provision of public services via ICT. It also implies electronic transactions between government and other actors such as citizens or businesses in society through new technologies including the internet (e.g. Evans and Yen, 2005; Gil-García and Pardo, 2005). In brief, the concept of e-Government includes all applications of ICT that improve efficiency, effectiveness, transparency and accountability of daily government administration (e.g. Moon, 2002; Sharma, 2007). The broader concept, expanded from the simple definition of central and local government electronic administration, sees e-Government as more citizen-friendly, providing enhanced public services and improving productivity of the public sector via extended networks and advanced technologies. Alternatively, as indicated for instance by Nour et al., (2007), e-Government can be defined "as a complex socio-technical system in which heterogeneous stakeholders are interactively entangled to fulfil their best interests".

In this connection, e-Government has been examined and analysed in diverse research and from different perspectives. Many argue that it should even be a discipline in its own right, notwithstanding its clearly multidisciplinary character. So far, as described by Cordella (2007) 'the dominant literature has seen e-Government as a next step in the rationalisation of government activities along the lines of the New Public Management' (NPM) (from Bellamy and Taylor, 1998, to Fountain, 2002, and Heeks, 2002). The concept and practice of e-Government has also been analysed in depth from an Information Systems Theory point of view (e.g. Avgerou, 2002, Ciborra, 2005, and Batini et al., 2009). More often, e-Government is conceived as a non-scientific domain, to be analysed purely from the practitioner's point of view, giving specific consideration to the different "pillars" of the NPM agenda: efficiency, accountability, decentralisation and marketisation.

Criticism of these views has also emerged in the literature, in for instance Dunleavy et al. 2005, Finger and Pecoud, 2005 Misuraca et al., (2006 & 2008). These authors point out the inherent 'multi-

7 See also http://www.peterhinssen.com/

dimensional components and levels of governance that need to be taken into consideration when analysing e-Government, especially in a globalized context where the state is being transformed and there are dynamic tensions between rapid technological developments and regulations. Therefore, e-Government can be seen as a middle-of-the road concept, which identifies the various levels of governments, mainly through their administrations and —subsidiary— through the access of citizens to public affairs, which aims to promote: 1) better and more efficient administration; 2) more effective inter-administration and administration-enterprise relationships; and 3) user-empowerment and more transparent access by citizens to political decision-making' (Misuraca 2009 and 2010).

4. Today's Policy Framework

The European eGovernment Action Plan 2011-2015, launched by the European Commissioner for Digital Agenda, Neelie Kroes during the conference, paves the way for the transition of e-Government into a new generation of flexible, seamless Open Government services at local, regional, national and European level that will effectively empower citizens and businesses (EC, 2010c).

During the two day event, there were constant reminders of the economic and political reasons for European collaboration in e-Government. EU President Herman Van Rompuy, Commissioner Kroes, and the Director General of the Commission's DG INFSO, Robert Madelin remarked on how the eGovernment Action Plan fits into the hierarchy of EU and Member State policies. They underlined the fact that it impacts on most, if not all, flagship initiatives of Europe2020, particularly the Digital Agenda flagship initiative. Above all, however, they stressed that e-Government work aims to build a special, open and engaging relationship with Europe's businesses and citizens (at all levels: local, regional, national and pan-EU) and that this is a key aspect of the society Europe will build as it moves forward.

The Belgian Minister for Economics and Administrative Simplification, Mr Vincent van Quickenborne, emphasised that ICT in public administration is not only about open data flows, virtualisation, greener IT, and cost saving due to greater efficiency. He claimed that ICT in e-Government have to be understood as the enablers of more agile, timely, and flexible public services. These, in turn, will be the building blocks for innovation which will boost competitiveness. Finally, he emphasised the role of the European Commission as the promoter of a pan-European e-Government ecosystem.

The Director General of the Commission's DG DIGIT, Francisco García Morán, picked up on the crucial need for interoperability to achieve the EU goal of a digital Single Market. Interoperability (semantic, legal, technical and operational) is the cornerstone required for transactions in goods and commercial services and for making mobility of citizens and business a competitive reality. It is the necessary condition for seamless pan-European public services, which must have common standards, active collaboration, information and experience sharing. García Morán announced that the EC is committed to leading by example by implementing the "e-Commission" strategic framework to improve its efficiency and transparency through the best use of ICT.

The Commissioner for Inter-institutional Relations and Administration, Maros Sefcovic, followed by announcing the Commission's adoption of the Communication 'Towards interoperability for European public services', an initiative to encourage public administrations across the EU to maximise the social and economic potential of ICT. The Communication looks at establishing a common approach for Member State public administrations and at helping citizens and businesses to profit fully from the Single Market.

Throughout the conference it was generally acknowledged that a decade of declarations and action

plans has shown that governments can optimise their efforts by working together. In this respect, the Commission has played a special facilitating role, spelled out more clearly than ever in the Action Plan for 2011-2015. However, the new action plan emphasises that the lion's share of effort must come from the Member States and from the people and businesses of Europe.

5. Achieving Efficient and Effective e-Government

The Conference provided an opportunity to collect perspectives and evidence on where Europe stands today. In the plenary session on "How efficient and effective is my government?", challenges and leading examples were presented and discussed. The Dutch Public Administration presented the impact of the Digital Client Dossier. Belgium provided an overview of the Belgian business register (CBE) as a case study to discuss what opening up government implies in practice. In the case of the CBE, it required the re-engineering of the entire government data structure, and overcoming the challenge of establishing coherence between legacy systems.

However, in order to reap the benefits exemplified by successful cases, governments must be able to provide answers to questions like: How efficient is my back-office and how effective is delivery as perceived by the users? This leads to other questions, such as: How long will it take me - in people time or business time - and is it getting better? Will it be easier next year? Will the system part-fill all the forms by re-using last years' data, saving time for citizens and business and also for the Public Administration?

A common challenge is to establish the metrics of effectiveness, and to measure investment versus creativity. Mrs Mechthild Rohen, Head of Unit for "ICT for Government and Public Services" in DG INFSO explained that the Action Plan tackles this challenge. Rohen said that efficiency and effectiveness imply the provision of new services of higher quality and the capacity to "do more with less". To achieve this, a fundamental re-engineering of processes and the reorganisation of institutional boundaries and administrative rules will be initiated with the support of ICT.

ICT can indeed help break down silos and open up government processes (e.g. through open data). It can enable new forms of collaboration to design and deliver public services (user-generated public value, according to the Web2.0 model). Furthermore, service-oriented architecture can help generate innovative services through the flexible combination of modular components. Mrs Rohen also said that the European Commission is clearly committed to leading this transformation by example. In this respect, the Commission has put in place a strategy to open up data and a plan for seamless cross-border eID and procurement schemes. The Action Plan sets out a common agenda for the European Commission and the Member States over the next five years, incorporating open government elements, which will contribute to improving the efficiency and effectiveness of European public administrations.

This plenary was closed by Mr Randeep Sudan - Lead ICT Policy Specialist from the World Bank - who centred his intervention around the visual analytics, and the geospatial, mobile, and social networking capabilities of today's ICT. He focused on the potential behind distributed data collection via mobile phones for a real-time, bottom-up data stream for action (traffic jams via mobile, weather conditions via Twitter). His point was that ICT today enable citizen-empowered government and this may generate a great deal of value, especially in developing countries (innovate, connect, transform).[8]

8 See the World Bank initiative eTransform at http://web.worldbank.org

6. Policy Challenges

The conference organisers put particular emphasis on the challenges that lie ahead. These need to be addressed if we are to benefit from an open model of governance, enabled by today's ICT. Based on our analysis, the challenges have the following key dimensions.

The first dimension encompasses the **relation between governments and the citizens and businesses** they are meant to serve. The five ministerial declarations demonstrate governments' undeniable concern with becoming more and more citizen-and business-centric. However this ambition depends on the capacity of governments to survey the actual needs, expectations and desires of their target population before attempting to re-design processes and services to satisfy such needs and desires. The capacity to establish a continuous two-way dialogue between governments, public administrations, individuals and collective agents is still one of the major challenges for the deployment of an open model of governance; a model where citizens are empowered as voters, tax payers, service users and active participants in the creation of services that have a collective impact.

The second dimension covers aspects of **technological evolution**. The trend towards the virtualisation of processing and storage capacity in the Cloud environment will not disappear. But though cloud computing provides interesting efficiency and cost saving opportunities, it also creates a plethora of uncertainties in terms of privacy and security. Such uncertainties are not new. They have prompted a number of wider legal questions, and demand the definition of a regulatory perspective on the evolution of eServices in a distributed computing space. Still on the technological ground, increasing constraints are being imposed in terms of energy efficiency on production processes based on computing power. Moving towards greener IT is inevitable. The challenge is not only technical, but economic and political as well. In addition, the costs and benefits of the virtualisation of computing resources, as well as the deployment of energy-saving ICT, have to be assessed and measured. The capability to measure the costs and benefits of new technology deployment is not the only challenge at measurement level in an Open Government perspective. In addition to transparently delivering efficient and effective eServices, the public sector must set in place the means to assess the impact of ICT-enabled transformation in terms of both economic performance and back-office and transaction costs. This need to collect empirical evidence for cost-benefit analyses and to estimate return on investments extends to the mapping of public value and to the measurement of stakeholder satisfaction.

Finally, the **regulatory dimension** is creating bottlenecks in the implementation of a uniform landscape of pan-European public services. The absence of a binding European legal framework for identity, company law, contract law and data protection is de facto a barrier to effective seamless interoperability and to the building of the European digital single market. The existing legal framework, at both national and European level, may need to be revised to better reflect the changing technological and market landscape. In theory, legislation should be technologically neutral so as to be independent of technological evolution. Therefore, the principle of technological neutrality is crucial from both systemic and legal perspectives. Efforts to assess the existing regulations are already underway. However, it must be considered that sometimes the national roles of different governmental organisations hinder the growth of cross-border activities and transactions. In other words, they are forced to adopt regulations and positions that prevent cross border activities due to national considerations.

7. Building Trust in the Single Digital Market

One of the Action Plan's priorities is the development of seamless cross-border e-Government services that correspond to well-defined needs, enabling entrepreneurs to set up and run businesses anywhere in Europe independently of their place of origin, and allowing citizens to study, work, reside and retire anywhere in the European Union. A number of important pilot projects which focus on specific cross-border services were presented at the Conference.

In the plenary session **"Putting the Internal Market in Practice: How can I trust the rest of Europe?"**, the results and benefits of the European Large Scale Pilots —STORK, PEPPOL, SPOCS and epSOS— were presented. These projects deal respectively with electronic identity, public procurement, registration of services, and patient health records. Each of them represents a fundamental pillar of delivering electronic government. They provide a model for how EU government agencies can cooperate to deliver seamless cross-border services. The pilots were praised as a source of inspiration for effective collaboration and development of sustainable solutions. It was also interesting to see that the results from one pilot were key enablers for the other pilots.

These projects were designed to remove administrative barriers to the delivery of services on a non-discriminatory basis to all businesses and citizens across Europe. The next step will be to benefit from synergies between the projects by re-using existing infrastructures, sharing results from the large scale pilots, and by identifying gaps and opportunities. In this way, development efforts may be aligned and it will be possible to assess the real social and economic needs, cost-benefits and barriers for future cross-border services where interoperability is key. In fact, it seems that although we have the technical solutions, we still need to bridge the national trust models and harmonise legal structures.

The e-Government Action Plan foresees an assessment of the solutions developed, and based on this, Member States will agree a list of key e-Government cross-border services that could be available in the 27 EU Member States by 2015.

In the following plenary session — **An Open Battle for an Open Government** — CEOs from private sector companies (Bull, Microsoft, Oracle, Siemens and Verizon) discussed the value that their companies provide to the public sector.

The debate addressed the critical issue of how governments can trust the private sector and how a multi-stakeholder approach can be implemented effectively. Representatives from the ICT industry emphasised the need for a healthy public-private partnership. In such a partnership, the public sector would have the power to embed in its procurement process a multi-stakeholder project governance, which would ultimately deliver value to society.

It was acknowledged that part of the tension derives from the fact that government services usually take a long time to gestate, and are complex and interconnected, while the underlying technologies move faster than the standard lead time for system delivery.

The panel agreed that Cloud Computing and shared services are here to stay and that the open standard debate is crucial. Open standards must be pursued. The public sector has to make its motivations and objectives transparent so that the industry can deliver. The panel agreed that ICT is becoming a commodity and that security will be an increasingly important dimension that must be embedded in all ICT solutions by design.

In this final session, it clearly emerged that high levels of innovation and healthy competition are needed between suppliers and providers, but at the same time interoperability and borderless

compatibility are vital for the prime services of the Single Market. This undoubtedly requires a delicate balancing act that heavily relies on open standards for service definition, data structures and semantics. Web2.0, Cloud Computing and browser-based applications were very futuristic concepts when the first Action Plan was drawn-up a mere 5 years ago, whereas today they are technologies and approaches that cannot be ignored (they are the 'new normal', as the Conference's visionary speaker Peter Hinssen would say). So the task of delivering public services that demand high-levels of robustness, trust and openness and resulting heavy investment are indeed grand challenges for all of us to address.

8. Conclusions and future prospects

The main findings of the Conference could be analysed by applying the famous Gartner Hype Cycle (Fenn, 2008) to illustrate how e-Government in Europe, after reaching "the peak of inflated expectations", is now on the edge of the "trough of disillusionment". However, the events of the last 20 years (and the expectations of the Internet age) provide a strong sense of "*Déjà vu*" since Europe has stood on that same peak and peered into that same trough many times, but has had to get on with the job.

As effectively demonstrated at the Conference by Peter Hinssen, whose talk on the "new normal paradigm" for the future of Open Government reinforced Commissioner Kroes message about the shift towards a *weGovernment*, there is still work to be done to define exactly what is wanted and meant by 'Open Government'. Nonetheless, it seems clear that the open government movement will evolve as a partnership between governments, businesses and citizens. It is also evident that public sector information will need to be made more and more available for re-use by an extended range of stakeholders.

During the Conference, the 'futuristic' presentation by US Government CIO, Vivek Kundra, compared the US and the EU policy perspective on the future of public services. He pointed out how the US administration has grasped the nettle of Open Government by setting four priorities: i) cost saving (e.g. IT dashboard project), ii) efficiency and effectiveness, iii) cyber security, and iv) open transparent participatory government (based on the democratisation of data and the creativity of crowds which can lead to user-generated public value). The main difference between the EU and the US agendas for Open Government is that the US defines cyber security as an overt goal, something Europe should perhaps consider.

The Obama administration in the US is recognised as a pioneer in open government. On his first day in office, President Obama signed the Memorandum on Transparency and Open Government, *"ushering in a new era of open and accountable government meant to bridge the gap between the American people and their government"*. However, searching Wikipedia for 'Open Government' reminds us that *"the origins of open government arguments can be dated to the time of the European Enlightenment: to debates about the proper construction of a then nascent civil society"*. Open government can be defined as *"the governing doctrine which holds that the business of government and state administration should be opened at all levels to effective public scrutiny and oversight. In its broadest construction, it opposes the use of reasons of state and national security to legitimize extensive state secrecy"*.

Recent developments in the theory of open source governance constitute a clear inspiration for open government. These advocate the application of the philosophies of the free software movement to democratic principles to enable interested citizens to get more directly involved in the legislative process. However, open government is not just about open source and is much more about open data.

In Europe, first the UK Government and now other countries and regions, have released public data to help people understand how government works and how policies are made. Some of this data was already available, but data.gov.uk brings it together in one searchable website. Making this data readily available means it will be easier for people to make decisions and suggestions about government policies based on detailed information.

In this regard, the European Commission's Public Sector Information (PSI) Re-Use Directive (2003/98/EC) emphasises that *"Public sector information is an important primary material for digital content products and services and will become an even more important content resource with the development of wireless content services"*. Many Member States have already started to implement the PSI Directive and are following US paradigms in opening up data. For example, in the UK "Putting the Frontline First: Action Plan", a key recommendation is *"to radically open up data and public information in order to promote transparent and effective government and social innovation"*. Over a thousand public datasets - including Ordinance Survey mapping data, data underpinning NHS Choices and the Public Weather Service, real-time railway timetables, and more detailed departmental spending data - will be released and made free for reuse.

Going further, both the Visby and Malmö declarations during the Swedish Presidency of the EU Council in 2009 underline the need to make data freely accessible in open machine-readable formats, for the benefit of entrepreneurship, research and transparency. They also encourage the reuse of public data by third parties in order to develop enriched services that maximise the value for the public.

The EU Granada Strategy, defined under the EU Spanish Presidency in 2010, further emphasises the way forward for Open Government, based on the principles of transparency, participation and collaboration and characterized by the establishment of communication channels and direct contact between the public sector and citizens.

By putting government information online, and making it easy to find, readily available, accessible, understandable, and usable, people can now interact with their governments in ways never before imagined. Or, as the "Many Minds Principle" states, *"the coolest thing to do with your data will be thought of by someone else"*. Sharing data enables greater transparency; delivers more efficient public services; and encourages greater public and commercial use and re-use of government information.

But again, this only resolves part of the problem. In fact, the real issue is how to link these open data (and make sense of it). Linked Data, a term coined by Tim Berners-Lee in his Linked Data Web architecture note, is about *"using the Web to connect related data that wasn't previously linked, or using the Web to lower the barriers to linking data currently linked using other methods"*.

At a policy level, most government announcements and guidelines are associated with the open data initiative, but do not explicitly emphasize linked data. Only the UK government has declared its commitment to publishing data as linked data because it is convinced that this is the best approach available in a hugely diverse and distributed environment, in a gradual and sustainable way. In addition to this, we should also consider that reaching out to non experts is as important as making data available and linked. In this, ICT tools for simulation and visualisation can be an important support to both policy makers and ordinary citizens.

In summary, as soon as data and information are open, available, and well-structured, the power of crowds, which has transformed the news industry with the advent of blogging, could extend into just about every corner of the web. Since third parties are less constrained by rigid internal bureaucracies and strict accountabilities, they will innovate around the data far more quickly and

freely than government can. However, open data is a means not an end, and releasing the data is a small step in a long walk.

In conclusion, despite all the efforts and successes of the past decade (many of which were embodied in working applications shown in the exhibition hall of the Conference itself), it was agreed that work has by no means been completed. Indeed, though the political commitment, backed by the eager expectations of citizens and business, is stronger than ever, and there is a framework to assess performance along with an abundance of technologies, a lot of hard work lies ahead.

Since the Conference was organised by the Belgian Presidency, CHOCOLATE was chosen as an acronym for an easy-to-remember message to take away. This stands for: Citizen-centricity; Harmonisation; Openness; Cross-border collaboration; Organisational change; Legal frameworks; Action Plan; Trust; and Engagement. These could also be the main keywords and principles for the lift-off of a European Open Government Strategy. This strategy can only be effective if the boundaries of traditional e-Government are pushed back to resolve the complex societal challenges Europe faces by applying ICT-enabled innovations and collaborative governance approaches. Innovation, sustainability, economic recovery and growth will in fact depend more and more on the ability of policy makers to envision clearly and effectively both the root causes and the possible solutions to complex, globalised issues (EC, JRC-IPTS, 2010). Only thus can the main barriers to better governance be removed and a more open, innovative and inclusive digital Europe constructed.

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e-Governance in public sector ICT procurement: what is shaping practice in Sweden?

Is it reasonable to require any person or organisation to purchase specific software in order to be able to communicate with a governmental organisation? This question is at the heart of an ongoing debate in many countries within the EU, because of its implications for accessibility, transparency, democracy, and fairness in procurement and markets. In this paper we consider the inability of many Swedish governmental organisations to communicate in open formats, and report on an investigation into policy formulation which has led to this situation in one sector – local government. We conducted a survey of all municipalities in Sweden. The final response rate was 99%, after 4 months and a maximum of 7 reminders. We find that there is little or no evidence of consideration given to document formats when procuring software. And in a large majority of cases, there is no documentation of any decision process. Further, organisational adoption of application suites seems more influenced by tradition and a desire to upgrade existing IT infrastructure than by any form of analysis and evaluation prior to purchase. In several municipalities specific applications are even named in procurements, which is in conflict with EU directives. There is also considerable confusion amongst respondents related to the difference between application and file format. We make a number of recommendations. Evaluation of document formats should always precede decisions on application and should include interoperability and lock-in considerations. Municipalities must take responsibility for the evaluation of both document formats and office applications before adoption. Further, when assessing the total cost of ownership the analysis should include consideration of exit costs in the procurement. The study highlights a lack of strategic decision making with respect to accessibility, and a resultant lack of transparency with respect to ICT procurement.

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Keywords

Open Standards, IT-procurement, office applications, survey, current practice

> “In a large majority of cases there is no formal evaluation underpinning procurement decisions and no documentation of decisions.”

1. Introduction

In a public speech in Brussels, Neelie Kroes, then European Commissioner for Competition Policy, stated that

"No citizen or company should be forced or encouraged to use a particular company's technology to access government information." (Kroes, 2008)

In a strange twist to this statement, a report commissioned by the Swedish government (SOU, 2010) on access to public information states that:

"It is not reasonable to require an authority to purchase new software to be able to provide information in electronic form."

Does this represent a stand-off between the rights of an individual and the rights of government organisations? Or does it represent a natural tension which needs to be resolved technically? A clue is contained in the same report:

"Even if an agency discloses a public document in electronic form, it is irrelevant to the individual if that disclosure is made in such a way that he or she cannot access that information in readable form." (SOU, 2010)

To resolve this tension, then, there is a need to separate out the issue of software purchase – with the reasonable concern about public authorities having to maintain many systems to allow provision of documents in any requested format – from the issue of accessibility of document content. In interoperability terms, this reduces to a need for agreed standard formats, which can be supported by many software products provided on many platforms. This chimes with the recommendation from the Swedish archiving association TAM-Arkiv (TAM, 2010) for long-term access to documents, namely:

"Never use vendor dependent formats for long term storage if you can avoid it, because they often are too unstable, too unstructured, and with dependencies to different suppliers' business strategies." (stress as in the original)

The recommendation stresses the difficulty of assessing how long proprietary formats will be supported, and thereby finds them unsuitable for long-term storage. In fact, for decades organisations in the public sector have been concerned about the need for "avoiding vendor lock-in when procuring IT infrastructure." (Guijarro, 2007, p. 91)

With growing recognition of the problems associated with reliance on proprietary formats, there is a commensurate growth in calls for the use of open standard formats for document interchange. An important principle underlying the idea of an open standard is that it ensures that data can be interpreted independently of the tool which generated it. This is one of the main reasons behind the recommendations of the FLOSSPOLS (2005) project that: *"open standards should be mandatory for eGovernment services and preferred for all other procurement of software and software services."* In line with this, we note that policies on using open document formats in the public sector have been adopted in a number of European countries, including two of Sweden's neighbouring countries: Denmark (Denmark, 2010; ITST, 2010) and Norway (Regjeringen, 2009a; Regjeringen, 2009b).

With the adoption of such policies it is clear that there are European countries that expect software companies to adopt open standards "if they want their products to be used by the government." (Fairchild and de Vuyst, 2007, p. 150) One major justification for this is clear: when people want to "interact with government, in either their role as a citizen or a member of a business, they want to do so on their own terms." (Borras, 2004, p. 75)

Over the years, public sector organisations have used a range of different open and proprietary document formats. ODF (ISO/IEC 26300:2006) and PDF/A (ISO 19005-1:2005) are two open standard formats, which have been recognised as international standards (by ISO) and as national standards in many countries. Both formats have been adopted and implemented by different providers of software systems. Two examples of proprietary file formats are IBM's RFT-format and Microsoft's doc-format.

Open standards have been discussed by researchers and policy makers for a long time (e.g. Bird, 1998; EU, 2004; SOU, 2009). An *open standard* (EU, 2004; SOU, 2009) is a standard which has certain open properties. Such standards can be used as a basis for implementation in software systems under different (proprietary and open source) software licenses. A standard is "a published document that contains a technical specification or other precise criteria designed to be used consistently as a rule, guideline, or definition." (BSI, 2010) When a standard is published and its *technical specification* contains sufficiently detailed information it can be used as a basis for implementation in software applications. For example, the ODF document format has been implemented by several providers using different (proprietary and open source) software licenses (e.g. OpenDoc Society, 2011). On the other hand, the specification of the published Office Open XML standard (ISO/IEC 29500:2008) contains references to external web pages (referring to one specific company's own web site) which are not available. We note that these formats and standards have been extensively discussed (e.g. Brown, 2010; MacCarty and Updegrowe, 2009; Tsilas, 2008), but acknowledge that an analysis of this discussion is beyond the scope of this paper.

From a legal perspective, Swedish and European law for public procurement aims to achieve procurement practices that stimulate a fair and competitive market based on the important principles of transparency, non-discrimination and equal treatment (Directives 2004/17/EC and 2004/18/EC). These directives clarify the public procurement process and how technical specifications can and shall be used in such processes. An important basis is that technical specifications "shall afford equal access for tenderers and not have the effect of creating unjustified obstacles to the opening up of public procurement to competition". Further, a technical specification "shall not refer to a specific make or source, or to a particular process, or to trade marks, patents, types or a specific origin or production with the effect of favouring or eliminating certain undertakings or certain products." (Directive 2004/17/EC (Article 34) and Directive 2004/18/EC (Article 23)). Only on an "exceptional basis" (e.g. when functional requirements cannot be described and for a subject-matter for which there is no international standard) public procurement may refer to specific trade marks and products, but procurement of document formats and office applications is not such an exception.

In this paper, we first consider the recorded situation with respect to support for open document formats in Swedish governmental organisations. We then report on a new study of policies on document formats and ICT procurement related to office document processing. The objective is to understand the influences behind established practice in decision making in Swedish municipalities, and hence help to explain earlier findings of a lack of engagement with the issue of document formats.

2. Background

An earlier study investigated the level to which Swedish local authorities, health regions and governmental organisations were unable or unwilling to process an ODF file sent to them (Lundell and Lings, 2009). ODF was chosen as an exemplar of an open document format which some European governments insist on being supported by their organisations.

Less than a quarter of local authorities responded to the ODF questionnaire; more than two thirds of

respondents acknowledged that they were unable or unwilling to open the document sent to them in ODF. More than a third listed no open formats as preferred for receiving documents. However, a large majority endorsed proprietary formats for such communication.

A part of the investigation was into policies related to the document formats which were accepted. It was found that an understanding of document formats as separate from products using those formats was very low, and there was a surprising and worrying lack of associated policies and strategies available. Only 4 percent claimed to have a policy on accepted document formats, and of these the majority simply endorsed a proprietary format.

Policy making was found not to be transparent, with practice left to the influences of managers and technicians. There is also an evident gap between what public organisations have stated publicly about receiving documents in open formats and what those same organisations do in practice. There were authorities which claimed to accept communications in ODF, but were amongst those failing to open the ODF document sent. The majority which did open the ODF document responded to the questions in a proprietary format.

A second investigation looked at practice in local government with respect to electronic records of important board minutes (Lundell and Lings, 2010). These are not legally required to be archived in electronic form; the only legal requirement is for each municipality to maintain paper copy of the minutes of that board. It was therefore considered to be a good indicator of practice in the absence of a legal requirement.

In the study, minutes were requested, in their electronic form, for the executive boards. It was emphasised that the documents should be supplied in their stored format. The following minutes were requested from each: the most recent board meeting; a meeting from ten years ago; the oldest stored electronically. This gave a perspective on availability and the document formats used. It was found that there are already significant gaps in the electronic archives.

No municipality was found to have a policy with respect to maintaining electronic copy of executive minutes. In the absence of a direct duty to preserve electronic copy, paper copy is still overwhelmingly seen as the only archive medium. This is in spite of the fact that Sweden is considered amongst the most advanced countries in e-Government.

Where electronic copy is kept, it was found that proprietary and closed formats are overwhelmingly used for public documents. This was the case even though there was experience of losing access to documents because of formats which were no longer supported. Further, there was no evidence that the situation was changing. No municipality provided a document in a reusable, open standard document format, in stark contrast with stated central Government vision.

In fact, in its 2004 IT bill (2004/05, 175), the Swedish government declared that the use of open standards should be promoted (Regeringen 2005; EU 2005). We also note that the responsible minister for Swedish municipalities has expressed support for open standards as defined in European Interoperability Framework version 1.0 (Odell, 2009), which has also been adopted in the Swedish e-Government strategy (SOU, 2009). Further, based on a legal analysis by the Swedish Association of Local Authorities and Health Regions, there is a recommendation that citizens should be allowed to communicate with members using the established open standard ODF (Lundell and Lings, 2009; SALAR, 2007; SALAR, 2008).

3. Research Method

The research question addressed through this study is the following. Given that certain document formats are preferred by municipalities in Sweden, to what extent are these preferences informed by policies, either related to document formats or to software procurement?

The question is made easier to answer in Sweden, which has a very strict policy on governmental responses to questions: all questions must be responded to. We sent an email in plain text to each municipality (290 in all), with follow-up reminders sent over a three month period. The email contained six requests.

In the first section, the municipalities were asked about document formats, specifically the format actually used by each municipality in their earlier communication with us. The first was a request to supply any policy or strategy document related to sending out documents in the specified format. The second was a request to inform us of any organisational decision behind the use of the specified format, and to supply any documentation. The third asked for information about any planned revisions to working practice.

The second section related to software procurement, and in particular that related to software for writing office documents. The first two requests were for factual information about the application primarily recommended within the municipality: what is it and when was it (or an earlier version of it) first introduced into the organisation? The third was a request for the documented decision (along with any other related documents) for the most recent procurement related to the application.

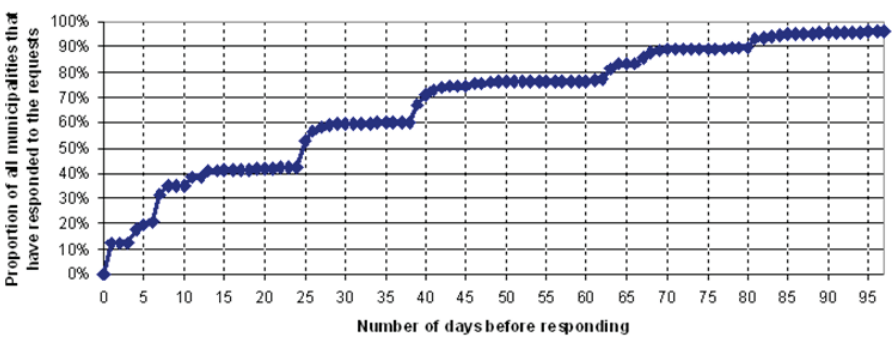
The study resulted in both quantitative and qualitative data. Quantitative data was analysed to gauge the overall position with respect to informed decision making about document formats and office applications. The text of responses, together with that of any supplied documents, was analysed qualitatively, to give some insight into the real state of practice.

4. Responsiveness to the questionnaire

The request email was sent to the registered address of each municipality. A municipality is required to respond promptly (at least with an acknowledgement), usually interpreted to mean within 24 hours. If no response was received within a working week, then a reminder was sent. This continued with, after the second reminder, increased emphasis that the email included a request for public documents that they are required by law to respond to.

This resulted in the response profile shown in Figure 1.

Figure 1: Evolution of response rate over time



As can be seen, 20% (59) of the municipalities responded to the initial request within 3 working days. A reminder elicited further responses, resulting in a 42% response rate (122) after 3 weeks. After a second reminder, the majority (59%) had responded. The final response rate after 4 months was 99%. Overall, a maximum of 7 reminders was used, although many further interactions were required to probe more deeply when initial responses were inadequate. Four municipalities failed to respond.

Some delays were evidently caused by confusion over who should respond, no individual feeling able to respond to all requests. This meant that the email was circulated within the organisation. In some cases this resulted in partial answers being given from different parts of an organisation – primarily a split between answers to the two sections of requests. The second section was often answered by the ICT department. This even resulted in different responses being made to the same request by different people within the same organisation. In a small number, one ICT department served several municipalities. This caused initial confusion over whether an individual response had been made on behalf of more than one municipality.

A few municipalities explicitly declined to respond and some provided partial responses, which were probed further. It is possible that some people interpreted the email as a survey and missed the fact that it contained explicit requests for public documents. A few spent time on a response refuting their obligation to respond. In these cases, a simpler request for the required documents was sent (with reminders) which did elicit some responses.

We estimate that, for a well organised authority, it should take less than ten minutes to respond to the email (we have anecdotal information which reinforces this), so it is unlikely that resource demand was a significant factor in a decision not to respond, or in an extreme delay in responding.

5. Observations from the analysis

Few municipalities have a documented policy regarding the use of document formats (see Table 1).

Table 1: Existence of a documented policy on document formats

Documented policy for document format exists?	Percentage of municipalities
Responded yes	2%
Responded no	95%
Decline to respond	3%

Only 2% of all (290) Swedish municipalities claimed to have a documented policy for the practice of sending out documents in the specific formats used by their municipality. By far the majority (95%) specifically responded that there was a lack of documented policy/strategy. The remaining 3% declined to respond.

In total, 19% of all municipalities supplied documents in response to our request for evaluations and decisions related to document formats and office applications. However, only 8% of all municipalities supplied relevant documents. Among the documents considered not to be relevant were web publication policies; layout instructions; and instructions for how to write documents. It should be noted that no municipality provided a TCO analysis which considered exit costs related to a possible selection of a proprietary document format.

A clear majority (92%) of all municipalities recommend and support MS Office as the primary office

application in their municipality for writing office documents; 5% of all municipalities did not mention any office application, or declined to respond on this point.

Most municipalities primarily recommend and support only one office suite for writing office documents. Overall, 86% of all municipalities only recommend and support MS Office in their administration, and 3% only recommend and support OpenOffice.org. A number of municipalities recommend a combination for their own administration: 5% a combination of MS Office and OpenOffice.org, and 1% a combination of MS Office and StarOffice. Another 4% recommend MS Office for their administration, but OpenOffice.org for (some or all of) their schools (see Table 2).

Table 2: Preferences for office applications

Preferred office suite (tools) for writing office documents	Percentage of municipalities
MS Office	86%
OpenOffice.org	3%
MS Office & OpenOffice.org	5%
MS Office & StarOffice	1%
MS Office (for administration) & OpenOffice (for schools)	4%

With few exceptions, municipalities do not undertake any evaluation of either document formats or office applications before adoption. For example, one municipality responded: *"No formal, political decision exists; neither is there any documentation or evaluation."*

Further, the lack of a documented decision related to the selection or procurement of an office application is common to most municipalities. In some, decisions are taken locally with roll-out throughout the organisation without any evaluation: *"The decision was taken by our IT advisory board; no direct evaluation was done. An organisation-wide adoption was made for all units."*

In some municipalities, the lack of documented evaluations and decisions make the authority defensive, so that except for supplying a copy of the signed contract with their supplier they refuse to elaborate: *"Referring to the above, we report that the procurement of our office suite was done through the Select Agreement. We decided on Microsoft Office and attach the agreement with Microsoft. We decline to answer your questions."*

Of the municipalities claiming to do some kind of evaluation, most seem totally dependent on processes for IT procurement provided by central agencies for public sector procurement in Sweden, such as Kommentus and Kammarkollegiet. For example, such dependency is clearly illustrated in this response from one municipality: *"There has been no local procurement as we participate in SKL Kommentus AB's and Microsoft's Select Agreement."*

These central agencies are dedicated to supporting municipalities and other public sector organisations by establishing central contracts from which each municipality calls off licences for office applications. For example, one municipality cites the evaluation performed by the central agency in their response on evaluation, stating that they *"have used the coordinated procurement of software (Microsoft Select) by Kommentus since the mid-1990s. Common evaluation criteria include price, delivery times and other parameters."* From their complete response it was made clear that the evaluation performed by Kommentus has been their only evaluation, which implies that they have been dependent upon this centrally performed evaluation for around fifteen years. Several municipalities gave similar responses. There is evidence of a common view that some form

of evaluation of the office application itself (i.e. the product) is being performed in such central procurement activities.

However, the evaluation of office applications undertaken by Kammarkollegiet and Kommentus does not address functionality, licensing or pricing of office applications. Instead, their evaluation is entirely focused on evaluating the reseller. Hence, even if a municipality signs such a central procurement agreement, there is still a need for them to undertake their own evaluation and analysis of document formats and office applications in order to assess the product before adoption.

Amongst the municipalities that actually have undertaken evaluations that consider file formats, one responded that a decision was made *"to standardize on file format, rather than product."* A few municipalities report that they have initiated work on developing a policy for document formats: *"We are working on developing a policy document that describes how and in what format external document are communicated. We will certainly decide that documents that should not be edited must be in PDF format and others must be sent in a non-proprietary format, RTF or possibly odf. Today we have .doc as the document default."*

Overall, we found that a clear minority (1%) of all municipalities have considered format prior to purchasing office application.

Amongst municipalities that have evaluated applications there are mixed views on applications, and outcomes of evaluations differ. For example, a municipality that evaluated OpenOffice.org found that it fulfilled their needs: *"Since OpenOffice has all the required features and also implied a financial saving the choice has not been difficult."* On the other hand, a municipality that introduced MS Office concluded differently and recommended MS Office 2007 after their evaluation: *"(Microsoft Office) was introduced in the mid-1990s and was evaluated in 2007, along with OpenOffice 2.4 ... Primarily we recommend MS Office 2007."* This further reinforces the need for local evaluation.

From the responses it was clear that there is considerable confusion amongst respondents related to the difference between application and file format. Amongst the responses concerning application, respondents mentioned specific names of suppliers and applications (in almost all such cases the responses included one or both of "Microsoft" and "Word"), whereas in other cases responses referred to specific versions of a specific office suite (e.g. "MS Office Word 2007"). Regarding responses for file formats, respondents mentioned suppliers (e.g. "Microsoft"), applications (e.g. "Word"), and formats (e.g. "Microsoft formats"), and in several cases initially gave incomplete, unclear, and confused responses. In general, from the number of requests for clarification (via email and over the telephone) we note that many respondents do not see a difference between applications and a file formats.

Most municipalities primarily focus their attention on adopting an office application; the file format issue is treated as a consequence of the application choice. For example, one municipality responded that they consider applications as standards and have decided to use these with their 'default' file formats: *"(The municipality) views Microsoft Word and Adobe (i.e. doc and pdf) as de facto standards and has chosen to use them without major evaluation."* Several others acknowledge that they lack a policy on document formats, but respond that the choice of format is implicitly determined from the choice of application: *"We do not have any specific document that regulates document formats. Instead it is determined over time by monitoring the software version agreed within the municipal organization."* Yet other municipalities report that, without a decision, they just use the 'default' format which is supported by their application: *"there is no written decision with regard to document formats, but in practice .docx is the default setting."*

A number of municipalities have a practice of renewing licenses. Renewal of licences is usually being done without evaluation, perhaps over many years. In many cases, the procurement decision dates from a very long time ago. In other cases, municipalities use centrally procured agreements for renewal of licenses (so it is not considered a new procurement). For example, one municipality responded: *"We have not bought the software, rather we have held licenses since 1992. These licenses have been extended since then and upgraded on a continuous basis. No procurement was done in 1992."* A different municipality adopted a proprietary product and the office suite has not been evaluated since then: *"In 1997 it was decided that the municipality would use the zac-concept (zero management concept) which is a Microsoft-oriented approach. Since then, the Microsoft platform has not been evaluated. Procurements that we do therefore are for MS Office licenses."*

Evaluation of file formats and office applications for a municipality cannot be undertaken in isolation of already adopted IT-systems due to various kinds of potential lock-in problems. Therefore, any evaluation and adoption of an office suite needs to consider other systems which have already been adopted. Several responses in the survey indicate that other systems already in use in the municipalities are perceived to dictate requirements on the document format and the office application. Hence, the responses indicate several examples of different kinds of lock-in scenarios, including format lock-in and vendor lock-in. Most such systems require the proprietary .doc format, which makes migration to the open document format (ODF) difficult. For example, one municipality responded that *"many of the IT systems that we already use, or that we intend to procure within the administrative sections, are integrated with, and in some cases totally dependent on, functionality and components in MS Office."*

Interoperability is critical for municipalities, but several responses indicate that such vendor lock-in is problematic. As illustrated by one respondent: *"Today, suppliers of enterprise support systems to the municipalities are tightly tied to Microsoft software. This means that in practice it is very difficult to use open source software to break the hegemony that exists."*

In many municipalities a different policy is adopted in schools since interoperability problems related to other legacy systems in the municipality is less of an issue. Overall, our responses indicate that in municipalities where there is less perceived lock-in they are more open to alternatives, as illustrated by this response from one municipality: *"Within administration, where application providers have selected the Microsoft track, we are forced to use their office suite. In schools, only OpenOffice is used."* Other responses showed that evaluation for schools in some cases is based on other factors for office applications: *"the discussion at the time was that Microsoft had the largest market share amongst companies and municipalities and that it was a good platform for students to learn"*.

The practice of sending out and receiving documents varies. Although several municipalities accept PDF there is a clear dominance of using proprietary document formats. For example, one municipality responded that: *"We send out documents in the format in which it is easiest to send them. In most cases, this is .pdf or .doc."* Two municipalities go so far as to expose, on their public website, which formats they accept: "(XXX) municipality can only receive files which are in one of the following formats: .doc, .txt, .pdf, .xls".

There is evidence of a limited but increasing awareness of issues related to document format and application options, including archiving. Some municipalities are beginning to separate out the issue of application from format, and are looking towards archiving needs, as illustrated by this response: *"Open, platform independent, and archive secure file and document formats are important."*

In addition to the vast majority of municipalities that use the proprietary .doc format for external and internal communication there is also a small group using ODF as a format for internal communication.

One municipality responded: *"If you are intending to send internally, it must be in ODF format."* However, in this group .doc is still used for communication with citizens. Amongst municipalities that have adopted ODF, responses show an awareness of the need to be flexible and behave accordingly, as illustrated by the response from one municipality: *"Internally, we use ODF. In external contact with partners, we are flexible and can adapt to who we are corresponding with, such as using .doc, etc."*

6. Recommendation for Practice

According to the results of the study, municipalities (or some other national public sector organisation) must take responsibility for the evaluation of both document formats and office applications before adoption. Evaluations should be conducted according to the specific needs of each municipality and its outcome should always be documented. A municipality cannot and should not solely rely on central purchasing organisations for setting policy and for analysis of their own requirements.

Any decision based on evaluation outcomes should be documented, and renewal of licenses should be treated in the same way as an initial procurement. Further, evaluation should be undertaken on a regular basis, and at least before each major adoption decision. Education policy should not be dictated by such things as current market share for office applications.

Evaluation of document formats should always precede decisions on application and should include interoperability and lock-in considerations. Enterprise support applications should not be procured if they dictate the use of a specific proprietary document format or office application. Further, when assessing total cost of ownership the analysis should include consideration of exit costs in the procurement.

Long-term digital archiving is a significant issue for both municipalities and citizens. It is tightly coupled with formats, both for preservation and long-term accessibility. A decision on formats is a policy decision, and must not simply be considered as a 'technical' issue that follows from an adoption of a specific office application. Municipalities should standardise (and base their procurements) on open formats, not on specific office applications.

Citizens should not be expected to buy proprietary software in order to communicate with municipalities; any policy on format must specifically address this point, and also any implications of differences between external and internal communication practices. From this, we recommend that citizens must be able to communicate with municipalities using open formats.

7. Conclusions

This paper has reported on problems for many Swedish governmental organisations to communicate in open formats. It specifically reports from an investigation into current practice and policy formulation which has led to this situation in one sector — local government.

There are many reasons for the reported problems, including a lack of leadership, awareness and know-how amongst practitioners and those responsible at different levels in Swedish municipalities and other public sector organisations.

Most municipalities do not undertake (or even initiate) an evaluation before procurement of software and adoption of document formats. In responses, reference is often made to central procurement agencies, and a number of municipalities seem to misinterpret both the scope and focus of evaluation

undertaken by those agencies.

Further, it seems that purchasing of application suites is largely a matter of history rather than strategic decisions. In some municipalities specific applications are named in procurements, which is in conflict with EU directives. This implies that many municipalities have made themselves over-reliant upon central agencies.

Each policy/strategy document received from a municipality was analysed to reveal how policies and strategies related to document formats were considered. However, some municipalities provided documents which did not cover document formats, and some responses indicated considerable confusion.

In conclusion, we find that there is little or no evidence of consideration given to document formats when municipalities procure software. In a large majority of cases there is no formal evaluation underpinning procurement decisions and no documentation of decisions. The study highlights a lack of strategic decision making with respect to accessibility, and a resultant lack of transparency with respect to ICT procurement.

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E-Participation: Looking Beyond Skills and Realising Public Value

Digital inclusion is a key part of the European Digital Agenda 2020. Without 'inclusion for all' the citizens of Europe will neither contribute to nor benefit from the promise of Open Government nor reap the potential economic and social benefits that can be achieved in the next 10 years. The traditional approach to inclusion has been to look at the provision of ICT skills and to help people to develop the necessary competencies that will enable them to participate in a digital economy. The context of digital inclusion is changing because of the impact of rapid developments in technology and the way that individuals and communities interact with each other and produce and consume digital content in the form of services and products. This means that to facilitate transparency of government operations we need to re-visit what we believe to be the capacity requirement for all members of society; we must re-examine the prerequisites for engagement and recognise the emerging opportunities for the co-production of public services in the form of public value chains and new business models. This is necessary in order that the transformation and e-enabling of front-line government officials will be effective in particular for those individuals and communities that are the biggest consumers of public services. Skills remain an important element of the digital inclusion agenda and this paper seeks to argue that there is a need to look beyond skills when addressing digital and social exclusion and to consider other ways to engage the disengaged in the light of the challenges that technological changes are bringing.

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Digital Inclusion, Co-production, Value Chains, Policy Challenges, Skills, Public Value

"The context of digital inclusion is changing because of the impact of rapid developments in technology and the way that individuals and communities interact with each other and produce and consume digital content in the form of services and products."

1. Introduction

The social impact of ICT is recognised by the European Commission as significant with more than 250 million daily internet users in Europe and virtually all Europeans owning mobile phones (European Commission, 2010). This adoption of technology is changing lifestyles. In addition, the convergence of services towards digital platforms means that within 10 years digital content and applications will be delivered almost entirely online. These developments are seen in a positive context where content and access drive demand which in turn attracts investment in technology and services. At the same time the Commission identifies a number of barriers to the realisation of the benefits of the new technologies, not least:

"...insufficient internet access, insufficient usability, by lack of relevant skills or by lack of accessibility for all." (European Commission, 2010, p.6).

In the i2010 Annual Report, the European Commission (2008) reported that in 2007 regular Internet users were 51% of the total population. By 2008 this percentage had reached 56% but this equates to approximately 218 million people across the EU 27 who remain digitally disengaged and probably excluded (Codagnone & Osimo, 2008). The Commission identifies a final 30% of disengaged users comprising older people, those on low incomes, those who are unemployed and those who are less educated who will not reap any benefits from information technology advances (European Commission, 2010, p.24 – 25). The percentage of homes having access to the Internet varies across individual countries from just 30% in Bulgaria to 90% in Austria (Eurostat, 2010) and yet the fact remains that those groups who are the lowest users of ICTs, in particular those who least use ICTs to access services are probably those who are the greatest users of Government services (Codagnone & Osimo, 2008).

2. Skills-Based Policy Approaches to Digital Inclusion

The Commission sees the answer in the promotion and delivery of digital literacy and competences outlined in Key Actions 10 and 11 (European Commission, 2010, p.27). Europe is not alone in recognising the importance of skills. The World Economic Forum report into ICT for Economic Growth (World Economic Forum, 2009) sees skills as one of the 6 pillars of the ICT Ecosystem:

"Best-practice countries have a solid base of ICT technical skills and a good level of broader science and math education. Interventions to improve ICT-relevant skills include focused training, certification and pipelines to university graduates in engineering and IT fields." (World Economic Forum, 2009, p.2).

The acquisition of skills is seen as the route to tackling poverty within the European Union and as a way of ensuring the capacity of the workforce to deliver a competitive Europe. (European Commission, 2010). The importance of digital competencies has also become synonymous with digital inclusion and subsequent declarations have identified skills as the route to participation.

"To be effective a smart, sustainable growth strategy must also be inclusive so that all Europeans are given the opportunities and skills to participate fully in an Internet-enabled Society." (European Commission (Granada), 2010, p.1).

Acquisition and implementation of digital skills is currently characterised by the idea of progression. The DigEULit project in 2006 identified seven headline skills (Martin-Grudziecki, 2006) and for each a "continuum of increasing competence from "novice" through "advanced beginner", "Competent"

and "proficient" finally reaching "expert" (Martin-Grudziecki, 2006, p.251).

The Renewed Social Agenda for Europe highlights the need for skills in the face of globalisation and rapid technological change (European Commission, 2008). It recognises the demand for skills as widening the gap between the skilled and the unskilled and the need for the EU to invest heavily in skills development (European Commission, 2008, p.6).

3. A Question of Social Relevance

However, this approach to participation while having a value in itself is not enough to ensure participation, particularly in the face of changes in technology and changes in people's behaviour and the way in which they use technology. The development of mobile technologies has meant that use of technology is less linear and less planned, more complex and random; and our expectations have changed so that we wish to consume digital content in the same way. At the same time there is a growing awareness of the potential for creating public value from the increasing availability and accessibility of publically owned data. This shift in thinking cannot be underestimated; the underlying philosophy of a skills-based approach to digital inclusion assumes that people will take a passive role as recipients of services. A further dimension of this hierarchical approach is the perception of the benefits realised by one who is digitally included. Van Den Bosch and Dekelver highlighted that participation in Internet use by people with low levels of education or income declines as complexity increases (Wouter Van Den Bosch, 2009). While stressing the need for proper training and guidance they pointed out that:

"...we should also look beyond skill and training alone, as what people expect, want and 'consume' on the Internet is also related to socio-economical status" ((Wouter Van Den Bosch, 2009, p.3).

A Price Waterhouse Coopers study for the Digital Champion (Price Waterhouse Coopers, 2009) proposes the benefits of digital inclusion as economic: higher earning potential, better educational opportunity, cheaper holidays, cheaper shopping. Arguably, such benefits have no immediate relevance to one who is both socially and digitally excluded and whose primary concerns are for survival and whose primary mechanisms are personal networks.

The World Economic Forum highlights the need to appreciate what it calls the complexities of an ICT ecosystem:

"As the growth and adoption of networked ICT services expand, policy makers must appreciate the unique behaviours of complex ecosystems. The behaviours of networked economies are non-linear" (World Economic Forum, 2009, p.8).

The concept of non-linear, networked behaviour should be seen to apply in the realms of social and digital exclusion and while understanding its importance we should be able to look beyond the skills progression and recognise that digital inclusion requires a much broader approach.

4. The Importance of Public Value

There is a real potential for ICTs to create public value in a way that is relevant by focussing first and foremost on outcomes for the lives of socially excluded individuals and communities. In European Ministerial declarations we begin to see recognition of importance of value creation. The Ministerial e-Government conference in Malmo outlined a vision for technology to deliver transparency, openness, efficiency and maximised public value which would support Europe's transition to a leading

knowledge-based economy (Enzell, 2009). This vision saw the empowerment of citizens and businesses and the involvement of stakeholders in the policy process (Enzell, 2009, p.2). At the same time there was recognition of the need to develop inclusive services to remove the barriers experienced by digitally or socially excluded groups (Enzell, 2009, p.2).The Visby Declaration (Näsvall, 2009) at the conclusion of the Swedish Presidency clarified the meaning of "value creation" as:

"...driven by information flows between different societal domains and enabled by technology take-up and demand, entrepreneurship as well as professional and everyday use." (Näsvall, 2009, p.1).

The importance of the need for equitable and inclusive access to information technology is reflected in the Granada Ministerial Declaration (European Commission (Granada), 2010), the declaration repeated the call of the Malmo Declaration (Enzell, 2009) for openness, transparency, empowerment, inclusion and public value.

What is important is that people should be seen as participants in policy making and in shaping their own future, not simply as recipients of services. There is a need to re-evaluate the offer to excluded groups so that it is more than just the type of economic benefits envisaged by current policy such as proposed by Price Waterhouse Coopers. Benefits can arise not just from helping them to use ICT but seeking opportunities to use ICT to help them. (Codagnone & Osimo, 2008). There is no doubting the importance of skills but we cannot equate skills alone with ideas of inclusion. We need to have a wider view when considering policy and initiatives. The impact of technological advances is that individuals are operating in a non-linear environment, seeking to meet their immediate needs first and then taking and developing ideas that arise within networks of common interests: the networks of the socially excluded are often networks for survival. The use of ICT needs to be re-contextualised and the approach to inclusion evaluated on the basis of that contextualisation. What we see today is that the rapidly changing nature of technology in society is creating new contexts and a single skills focussed approach may not serve the needs of those who are digitally excluded.

The Morgan Stanley Internet Trends Report 2010 (Wu, 2010) highlighted the rapid growth of mobile devices since their launch in June 2007, outstripping desktop internet access by some 55 million subscribers worldwide by 2009. By 2012 shipments of smart phones will outstrip shipments of desktop and laptop PCs combined. This growth in mobility and the expectation of mobile access is driving the development of new devices with a common technology base: tablet devices, MP3 players, GPS devices, e-Books, mobile video applications, games and wireless home appliances. Each new device and application is creating a new context in which we use technology. How ICT is used is evolving driven largely by rapid technological change which in turn is enabling new social contexts; once a single community which facilitated receiving services, such as access to advice and advocacy, developed a network of individuals based around a set of common needs. Now, such knowledge and experience can be captured and shared as needed and that experience can inform wider service delivery. Communities are no longer confined to being recipients but can also take the role of co-producers.

5. A Continuing Risk of Further Exclusion

A 2009 study by the Joint Research Centre looked at the role that social computing could play in generating public value. It identified four categories of impact: political, socio-cultural, organisational and legal (Huijboom, et al., 2009). While the study raised issues of privacy it also emphasised the potential for community cohesion around specific issues. Social computing opened up possibilities for enhancing transparency, stimulating the accessibility and personalisation of public services and improvements to efficiency. However, the report also highlights the danger that:

"In the near future, some groups may be excluded from participation in online social networks" (Huijboom, et al., 2009, p.11).

Despite the impact of rapidly changing technology and the way in which we consume and create digital content e-Inclusion is not a technological issue, but one of social inclusion and competitiveness (Guyader, 2009).

"eExclusion issues are direct consequences to the digitization of all of the activities of our societies, and because of the unprecedented vitality of that sector in terms of research and development and in terms of 'time to market'," (Guyader, 2009, p.12).

The Vienna Study focussed on the importance of 'broad based growth' as a route to "real and solid prosperity" being at the core of the Renewed Social Agenda (Codagnone, 2009). The report defines e-Inclusion as being the use of ICT to achieve broader social inclusion objectives and inclusive ICT; the I2 paradigm of inclusive technological innovation and innovative inclusive policies. However, the study also recognises that:

"...the pace of technological developments might also lead to further exclusion" (Codagnone, 2009, p.9).

We may well be in a position to achieve the Riga targets by 2015 without a change in the current policy measures but there is a clear risk also identified by Cadagnone and Osimo that:

"more people fall behind also as a result of unchecked technological and market developments raising new barriers that stop or hinder the efforts of those trying to catch up" (Codagnone & Osimo, 2008).

Because of the pace of change in technologies exclusionary processes may increase. The desirable individual benefits and societal outcomes that derive from digital inclusion depend on the use and appropriation of ICT and the lack of appropriation and purposeful use is at the core of digital inequalities (Codagnone, 2009, p.9).

The Vienna Study acknowledges that "generic digital literacy initiatives .... do not produce meaningful results ... unless they are linked to purposeful and substantive interests and needs" (Codagnone, 2009, p.10).

This change in emphasis is towards considering how the outcomes for the individual, their family and their community are important and relate to their interests and needs; not the needs of the state to deliver services. The changing technological environment is having an impact on the complex relationships between individuals, society and the economy. With a wider understanding of what it is that excludes individuals and communities, we need to look beyond skills to consider how we build capacity for excluded groups to use ICT to realise a difference, empower their networks and work for them.

"Looking across today's global networked society, one of the most notable differences is the manner in which value is created. While industrial economies are based on controlling the supply of scarce resources, networked economies create value by abundantly connecting individuals, functions and endpoints. As each new person and device is connected to a network its collective value grows exponentially." (World Economic Forum, 2009).

6. Policy Challenges

Looking at exclusion from the perspective of changing contexts brought about by the impact of rapidly changing technologies presents a number of policy challenges from: the current 'state of the art' in a rapidly changing environment; business models for inclusion policies which call for partnerships with both the private sector and civil society; and by the subsidiary challenges of leading policies which range from United Nations Conventions through ISO standards bodies to EU Council resolutions (Guyader, 2009).

"The State of the e Union", a collection of essays edited by Gotze and Bering (Gotze, Pedersen, & Tapscott, 2009) highlighted 4 pressures driving the need for change in the public sector:

- the technology revolution of Web 2.0 which is changing the way we produce and consume information;
- the demographic revolution of the "Net Generation" the first generation to come of age in the digital age having different expectations of how they consume information;
- social networking, the explosion in online collaboration and self organisation;
- the economic revolution, how that collaboration is changing the way in which enterprise innovates and orchestrates capability.

The policy shift viewed historically shows the journey from government that provides information electronically, through the drive to deliver transactional services and "do business with government" to where we are now, the potential for the co-production of services, relevant to the individual and the community enabled by technology. Such changes recognise the potential for empowerment and inclusive government through Web 2.0 technology. Such potential for re-use of public data in order to create public value is exemplified in England by the work of Mayo and Steinberg (Cisco Systems Inc, 2009).

7. An Outcome-Based Approach to e-Inclusion

There is an emerging idea of how a successful outcomes-based approach to e-Inclusion might look. The implications of a beyond skills approach focussing on public value and outcomes are given form in the think piece from the Institute of the Future "A Planet of Civic Laboratories" in which the importance of data generated through everyday technology could and should drive planning and policy development in cities (Institute of the Future, 2010). Delivered in the form of a map which looks at key technologies, strategic drivers and stakeholders the piece looks at the role of excluded communities and speculates on how they will need the capacity to use the data generated through technology to influence decisions that impact on how they create value for themselves. This ability to recognise need, identify partners and to co-produce services defines a new value chain which begins with open and transparent government and as such requires a different approach to digital inclusion. This is the logical extension of what Codagnone and Osimo described as using ICT to help them.

These policy challenges suggest that we should refocus the European debate on these questions and enable the European Digital Agenda to take on board the broad conclusions. The importance of digital inclusion that goes beyond skills and refocuses on building the capacity of excluded groups to influence how services are delivered and to identify what services are needed and to participate in their planning and delivery. Such an approach is highlighted by the World Economic Forum:

"Designing for inclusion entails the need to focus on human-centric value creation in all phases of the lifecycle. Given the highly personal nature of mobile communications, in-depth market sensing, rapid prototyping, community led distribution and sound feedback loops are all needed to ensure that services are appropriately tailored to meet the complex and changing needs of the poor." (World Economic Forum, 2009).

8. Conclusions

Current EU policy recognises the importance of ICTs for the development of the economy and the key role of skills as part of that strategy. Unfortunately skills development has become synonymous with digital and social inclusion. Despite the improved access to infrastructure and skills there remain significant numbers of excluded people who are probably most in need of services that governments seek to deliver on line. There is a question regarding the relevance of the current promises of improved earning potential and easy to acquire, cheaper consumer goods as the benefits of digital inclusion to hard to reach, digitally disengaged people. Developments in technology are changing the way in which people interact with the digital domain and changing expectations. There is an increased potential to use ICTs for the benefit of disengaged groups as part of giving them a voice and including them in the design of services to meet their needs. ICTs can strengthen their survival networks and empower them to help themselves. We need to rethink the digital inclusion offer. It is with this in mind that we should seek to refocus the European debate and enable the European Digital Agenda to take on board the broad conclusions.

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